CEO Contractual Protection and Managerial Short-Termism

American Accounting Association | Publications

CEO Contractual Protection and Managerial Short-Termism

Xia Chen
Qiang Cheng
Singapore Management University

Alvis K. Lo
Boston College

Xin Wang
The University of Hong Kong

ABSTRACT: How to address managerial short-termism is an important issue for companies, regulators, and researchers. We examine the effect of CEO contractual protection, in the form of employment agreements and severance pay agreements, on managerial short-termism. We find that firms with CEO contractual protection are less likely to cut R&D expenditures to avoid earnings decreases and are less likely to engage in real earnings management. The effect of CEO contractual protection is both statistically and economically significant. We further find that this effect increases with the duration and monetary strength of CEO contractual protection. The cross-sectional analyses indicate that the effect is stronger for firms in more homogeneous industries and for firms with higher transient institutional ownership, as protection is particularly important for CEOs in these firms, and is stronger when there are weaker alternative monitoring mechanisms.

Keywords: *employment agreement; severance pay agreement; managerial short-termism.*

JEL Classifications: *G32; M40.*

I. INTRODUCTION

Managerial short-termism, or managerial myopia, has attracted increasing attention from researchers and practitioners in the past couple of decades. Managerial short-termism refers to cutting long-term investments, such as research and development (R&D), to meet or beat short-term performance targets (Porter 1992). Prior studies have extensively examined whether and how managerial short-termism can be alleviated by enhancing monitoring or by granting stock-based compensation to managers (e.g., Bushee 1998; Cheng 2004; Farber 2005).[1] However, the role of CEO contractual protection in influencing managerial myopia has not been explored, despite the prevalence of CEO contractual protection and its importance in affecting managerial behavior.

In this paper, we investigate whether CEO contractual protection can affect managers' incentives to engage in myopic behavior and, hence, influence the extent of managerial short-termism. The fundamental driver of managerial short-termism is the pressure on managers to deliver short-term performance.[2] CEO employment contracts can ease such pressure by protecting CEOs from short-term performance swings and downside risk (e.g., Rau and Xu 2013). Thus, we predict that CEOs with contractual protection are under lower pressure to maintain high short-term performance and, thus, are less likely to engage in myopic behavior compared to those without contractual protection.

We focus on two types of CEO contractual protection: CEO employment agreements and standalone *ex ante* severance pay agreements.[3] CEO employment agreements are fixed-term comprehensive contracts between CEOs and firms; they generally specify termination payments and other terms such as non-competition and confidentiality. CEOs with employment agreements cannot be fired within the term without good cause. Standalone severance pay agreements stipulate the amount and terms of payments that executives can receive when their employment is terminated. CEO employment agreements and standalone severance pay agreements are the outcome of the negotiation between the firm and the CEO.[4] From the firm's perspective, such agreements increase the cost of firing the CEO, but they benefit the firm by incentivizing the CEO to undertake long-term risky projects and invest in firm-specific human capital. From the CEO's perspective, such agreements offer protection by compensating the CEO for termination and downside risk (Rusticus 2006; Xu 2012).[5]

---

[1] Overall, there is mixed evidence on whether equity incentives help alleviate managerial short-termism. While earlier studies find that CEO equity incentives reduce managerial myopia (e.g., Dechow and Sloan 1991; Cheng 2004), later studies provide mixed evidence, and some even suggest that equity incentives can induce myopic behavior (e.g., Cheng and Warfield 2005; Efendi, Srivastava, and Swanson 2007; Erickson, Hanlon, and Maydew 2006; Burns and Kedia 2006).

[2] See, for examples, DeFond and Park (1997) on the pressure related to job security, Matsunaga and Park (2001) and Comprix and Muller (2006) on the pressure related to executive compensation, Stein (1988) on the takeover pressure, and Stein (1989) on the capital market pressure to deliver short-term performance.

[3] A limitation of our study is that we only focus on CEO employment agreements and severance pay agreements. There are other types of contracts between CEOs and firms, such as change-in-control agreements and profit-sharing or royalty agreements, which extend beyond the term of CEO employment and provide CEOs with potential protection. We leave it to future research to investigate the effect of these other types of contracts.

[4] Whether the CEO can obtain such agreements and the terms of the agreements depend on the uncertainty of the business environment, the likelihood of the CEO being replaced, and the CEO's ability, among other things. See Sections II and IV for more detailed discussions.

[5] Although executives with an employment agreement or a severance pay agreement will not receive termination payments if they are fired with good cause, good cause usually does not include CEO incompetence or poor firm performance. That is, CEOs who are fired because of poor performance may receive termination or severance payments. For example, in April 2011, Six Flags paid out $30 million to the former Chief Financial Officer Jeffrey Speed in an arbitration case. Speed won the ruling by arguing that his dismissal without good cause violated his employment agreement with Six Flags (*Wall Street Journal* 2011).

We test our prediction using Standard & Poor's (S&P) 500 firms with required data over the 1995–2008 period. We hand-collect information on CEO employment agreements and severance pay agreements from proxy statements. Following previous studies (e.g., Baber, Fairfield, and Haggard 1991; Bushee 1998), in the main analyses, we capture managerial short-termism using the likelihood of cutting R&D expenditures. We choose this proxy because the trade-off between meeting current earnings targets and increasing long-term firm performance is particularly salient in the case of cutting R&D (e.g., Graham, Harvey, and Rajgopal 2005). Given that the existence of CEO contractual protection varies with firm and CEO characteristics (e.g., Gillan, Hartzell, and Parrino 2009; Rau and Xu 2013), we control for the endogeneity using both the instrumental variable approach and the Heckman (1979) approach (e.g., Doidge, Karolyi, and Stulz 2004). Consistent with our prediction, we find that firms with CEO contractual protection are less likely to cut R&D than firms without such protection. The effect of CEO contractual protection is economically significant; the difference in the likelihood of cutting R&D between firms without and with CEO contractual protection ranges from 7.1 to 8.2 percentage points, depending on the model specification.

We then investigate the differential effect of CEO contractual protection for firms whose managers have particularly strong incentives to engage in myopic behavior. We follow Bushee (1998) and focus on firms in which a potential earnings decrease can be averted by cutting R&D. Specifically, we split the sample into three groups. The small earnings decrease (SD) group includes the firm-years with pre-tax, pre-R&D earnings that are below the prior year's level, but by an amount that is smaller than the previous year's R&D. The other two groups are the large earnings decrease (LD) and the earnings increase (IN) groups. We expect the effect of CEO contractual protection to be stronger for the SD group than for the LD or IN group. We find that within the SD group, CEO contractual protection is negatively associated with the likelihood of cutting R&D; the marginal effect of CEO contractual protection ranges from 21.1 to 24.3 percentage points. In contrast, CEO contractual protection is not significantly associated with the likelihood of cutting R&D within the LD or IN group. In addition, the effect of CEO contractual protection is significantly different between the SD and the LD or IN group, as predicted. In sum, the effect of CEO contractual protection in alleviating managerial short-termism is primarily driven by the SD group, where the incentives for managerial short-termism are particularly strong.[6]

We develop and test several predictions to reinforce our main inference. We focus on the SD group to increase the power of the tests. We first predict and find that the effect of CEO contractual protection on managerial short-termism increases with the duration and monetary strength of the protection. We then conduct a series of cross-sectional analyses. First, if a firm is in a more homogenous industry, then it is easier to find a suitable CEO candidate and, thus, the threat of CEO dismissal is higher (e.g., Parrino 1997). Accordingly, CEOs without contractual protection may be more likely to engage in myopic behavior and, thus, the effect of CEO protection is greater in more homogeneous industries. Second, when shareholders have a shorter investment horizon, CEOs are under greater pressure to deliver short-term performance (e.g., Shleifer and Vishny 1990). Thus, we predict that CEO contractual protection is more important for firms with higher ownership by transient institutional investors. Third, because CEO protection and board monitoring are alternative mechanisms in addressing managerial short-termism, we predict that the effect of CEO protection is stronger when board independence is lower. Our empirical findings are consistent with all of these predictions.

---

[6] This result also helps to alleviate the concern that our findings are driven by an unobserved firm or CEO characteristics that affect both CEO contracts and R&D decisions.

In an additional test, we use the extent of real earnings management as an alternative proxy for managerial myopic behavior. Following prior studies, we measure real earnings management using abnormal production costs and abnormal discretionary expenditures and combine them to capture the overall extent of real earnings management. We focus on the firms that meet or just beat earnings targets in the analyses, because these firms are more likely to have engaged in real earnings management to meet short-term performance targets. We find that among the suspect firms, firms with CEO contractual protection are associated with a lower extent of real earnings management compared to those without CEO protection. This finding lends further support to our inference that CEO contractual protection mitigates managerial short-termism.

Our additional tests also suggest that the alternative explanation of differential investment opportunities does not explain our results. If our results are driven by differential investment opportunities between firms with and without CEO contractual protection, then we expect to obtain similar results for other types of investments, such as capital expenditures. In contrast, under the managerial myopia argument, we should not obtain similar results because, unlike cutting R&D, cutting capital expenditures does not improve the current year's earnings. Consistent with our argument, and inconsistent with the alternative explanation, we do not find a significant difference in the likelihood of cutting capital expenditures between firms with and without CEO contractual protection.

Our paper makes several important contributions. First, it contributes to the literature on managerial short-termism by documenting the effect of CEO contractual protection on managerial short-termism. Our evidence suggests that apart from board monitoring and CEO incentive compensation, CEO contractual protection can also help to address managerial myopia. The paper, thus, extends prior studies on CEO myopia, such as Dechow and Sloan (1991) and Cheng (2004), who find that CEOs who are close to retirement are more myopic and that equity incentives can partially alleviate such myopia. By explicitly controlling for CEO age and CEO equity incentives in the analyses, we provide evidence on the incremental effect of CEO contractual protection in the forms of employment agreements and standalone severance pay agreements, both of which are widely used in practice. We note that while both CEO equity incentives and contractual protection can address myopic behavior, the underlying reasons are different. While the former enhances the upside potential so that CEOs enjoy the benefits of successful long-term investments, the latter increases CEOs' job security and reduces the downside risk so that they are less concerned with the adverse consequences of unsuccessful long-term investments (Rau and Xu 2013).

Second, we contribute to the emerging literature on CEO employment contracts. This literature mainly focuses on the determinants of CEO contracts, and we extend it by examining the effect of CEO contracts on managerial short-termism.[7] While the popular press often associates employment agreements and *ex post* severance pay with managerial power and entrenchment, our evidence suggests that *ex ante,* such contractual protection can expand managers' horizons and address the agency problem of managerial short-termism. This speaks to the benefits of employment agreements and severance pay agreements. One caveat is that such contracts also have costs; for example, CEOs with contractual protection may shirk or become entrenched.

The remainder of this paper is organized as follows. Section II summarizes the literature and develops the hypotheses. Section III discusses the sample and data. Section IV examines the

---

[7] Note that our paper focuses on managerial myopia: cutting R&D or engaging in real earnings management to meet short-term earnings targets. It differs from concurrent studies that examine the effect of CEO contracts on firms' risk-taking (e.g., Huang 2011; Xu 2011). These studies find that, *on average,* CEO contracts are positively correlated with the *level* of long-term investments, including R&D and capital expenditures. In contrast, we examine whether managers cut R&D when they face a trade-off between meeting short-term earnings targets and maintaining R&D investments, circumstances where myopic behavior is most likely to occur.

determinants of CEO contractual protection and discusses how we address the endogeneity issue. Section V reports the main analyses and the cross-sectional tests. Section VI reports the additional analyses. Section VII concludes.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Research on CEO Employment Agreements and Severance Pay Agreements

A CEO employment agreement (EA) is a comprehensive *written* agreement that specifies the employment terms between a firm and its CEO, including the CEO's responsibilities, compensation, perquisites, termination conditions and payments (e.g., severance pay), and restrictions on outside activities. Note that a compensation contract alone is not regarded as an EA. A typical EA has a fixed term of two to five years and can be renewed, amended, or extended. Among the S&P 500 firms in 2000, Gillan et al. (2009) find that 225 firms have EAs with their CEOs, with an average term of three years. Within the contract terms, CEOs cannot be dismissed without good cause. "Good cause," as specified in EAs, usually includes breach of fiduciary duties and willful misconduct, but does not include incompetence or poor performance. In contrast, CEOs without EAs are employed at will.[8] A standalone severance pay agreement (SA) specifies the amount and conditions of the payments to a CEO upon the CEO's dismissal without good cause. The definition of good cause is similar to that in EAs. Unlike an EA, an SA typically does not have a definite term and, hence, covers the CEO for the foreseeable future.

Both EAs and SAs are the outcome of negotiations between firms and their CEOs. From a CEO's perspective, such agreements are beneficial because they offer protection. The benefit is likely to be higher when there is uncertainty over whether the CEO is a good fit for the firm and when the likelihood of CEO dismissal is high (Schwab and Thomas 2006). From the firm's perspective, such agreements are costly because they make it more difficult to renegotiate with the CEO or to terminate the employment. At the same time, these agreements allow the firm to attract CEO candidates who otherwise would not consider the position. They can also be used *ex ante* to address agency problems, such as managers avoiding risky, but positive, net present value projects or engaging in suboptimal behavior to deliver short-term performance (Almazan and Suarez 2003; Inderst and Mueller 2005; Rau and Xu 2013).

Several recent studies examine the determinants of EA or SA. For example, Gillan et al. (2009) study the determinants of EAs among S&P 500 firms. They find that firms with higher volatility of sales growth, with lower market-adjusted returns, and in industries with lower survival rates are more likely to have EAs with their CEOs, consistent with CEOs being more likely to seek protection when the uncertainty of the business environment is high. They also find that firms in more homogeneous industries and those with outside CEOs are more likely to have EAs with their CEOs, consistent with CEOs having a greater demand for contractual protection when there is a greater likelihood of being replaced. Finally, they find that CEOs with higher salaries and more incentive-based compensation are more likely to have EAs, consistent with the notion that contractual protection is more important when CEOs have more to lose. Rau and Xu (2013) and Cadman, Campbell, and Klasa (2014) find that SAs are more likely to be used when executives' human capital is at greater risk.

---

[8] For example, General Electric Company (GE) does not have an EA with its CEO. In its proxy statement, GE (2006) states that "GE does not, in general, enter into employment agreements with our senior executive officers. They serve at the will of the Board. This enables the company to remove a senior executive officer prior to retirement whenever it is in the best interests of the company."

It can also be argued that EAs and SAs reflect CEO entrenchment and poor corporate governance (e.g., Bebchuk and Fried 2004). The empirical evidence is mixed. On the one hand, Yermack (2006) and Rusticus (2006) find that the use of SAs is higher for firms with weaker corporate governance, larger firms, firms in more uncertain operating environments, and firms with outside CEOs. On the other hand, Rau and Xu (2013) and Cadman et al. (2014) conclude that SAs are largely a means of compensating for risk and do not find evidence suggesting that SAs reflect CEOs' rent extraction. Note that while the popular press sometimes laments the excessive *ex post* severance payments, prior studies and our paper focus on *ex ante* CEO contracts, not *ex post* payments.

The Main Predictions

Whether a CEO has contractual protection can affect a firm's operations. Gillan et al. (2009) argue that "CEOs facing less uncertainty are less likely to avoid risky positive net present value projects or to pursue overly conservative financing and dividend policies." Firms make similar arguments. For example, in its 2003 proxy statement, Sysco states that "Severance agreements were in the best interest of the Company and its stockholders in that they secure the continued services of these executive officers and ensure their undivided dedication to their duties without being influenced by the uncertainty of continued employment." Recent studies provide evidence consistent with the argument that CEO contractual protection influences the level of firms' investments (Huang 2011; Xu 2011).

We focus on how CEO contractual protection affects managerial myopia, i.e., whether managers cut long-term investments to meet short-term earnings targets. First, CEO contractual protection enhances job security. It is more costly for a firm to dismiss a CEO with contractual protection and, hence, the CEO will be better protected from short-term performance swings. Prior studies provide evidence consistent with this argument. For example, Rusticus (2006) and Xu (2012) find that CEO employment agreements and severance pay agreements reduce the likelihood of CEO turnover. In an untabulated analysis, we confirm in our sample that CEO contractual protection reduces the likelihood of CEO turnover after poor performance. Second, CEO contractual protection also partly shields a CEO from downside risk. The termination payments under the employment agreement or the standalone severance pay agreement act as a form of deferred compensation and safeguard against downside risk, thus encouraging the CEO to undertake long-term, risky projects.

In contrast, CEOs without contractual protection are at higher risk of losing their jobs after poor short-term performance and are more exposed to downside risk. Prior studies (e.g., Mergenthaler, Rajgopal, and Srinivasan 2012; Dikolli, Mayew, and Nanda 2014) find that failing to meet earnings targets significantly increases the likelihood of CEO turnover. Under the pressure to deliver short-term performance and to protect themselves from downside risk, these CEOs are more likely to engage in myopic behavior, provided that the board and/or investors cannot fully understand the implications of such behavior (e.g., Fudenberg and Tirole 1995; DeFond and Park 1997).

The above discussion leads to our first hypothesis:

H1: *Ceteris paribus,* CEOs with contractual protection are less likely to engage in myopic behavior than other CEOs.

CEO employment agreements and severance pay agreements vary in the extent of CEO contractual protection. Specifically, the duration and monetary strength of CEO contractual protection vary across firms. It follows naturally from the above discussion that the effect of CEO

protection increases with the duration and strength of CEO contractual protection. As such, we hypothesize further:

>   **H2:** *Ceteris paribus,* the moderating effect of CEO contractual protection on the extent of myopic behavior, as hypothesized in H1, increases with the duration and strength of CEO contractual protection.

Cross-Sectional Variation

In this section, we develop predictions for the cross-sectional variation in the effect of CEO contractual protection on CEOs' myopic behavior. As discussed above, the two key elements underlying H1 are (1) the protection of CEOs under the contractual agreements, and (2) the capital market pressure to deliver short-term performance. Therefore, we focus on firm characteristics that are related to the importance of CEO contractual protection and the degree of capital market pressure. Specifically, we examine the ease of finding an alternative CEO as proxied by industry homogeneity, and the pressure on the CEO to deliver short-term performance as captured by shareholders' investment horizon. In addition, we predict how the impact of contractual protection on CEOs' myopic behavior varies with the effectiveness of board monitoring.

Industry Homogeneity

Parrino (1997) argues that firms prefer CEO candidates with experience in a similar industry. Because it is easier for firms in more homogeneous industries to find CEO candidates, these firms are more likely to replace CEOs. Consistent with this argument, Parrino (1997) finds that both the likelihood of forced CEO turnover and the likelihood of an intra-industry appointment (i.e., replacing the current CEOs with executives from the same industry) increase with industry homogeneity.

Therefore, without contractual protection, CEOs in homogeneous industries have stronger incentives to undertake myopic behavior to meet short-term performance targets due to their job security concerns, compared to CEOs in heterogeneous industries. DeFond and Park (1997) provide evidence consistent with this argument. Thus, we expect CEO contractual protection to be more important in curbing CEOs' myopic behavior in homogeneous industries than in heterogeneous industries.[9]

Our third hypothesis, thus, is stated as follows:

>   **H3:** *Ceteris paribus,* the moderating effect of CEO contractual protection on the extent of myopic behavior, as hypothesized in H1, is stronger in homogeneous industries than in heterogeneous industries.

---

[9] Note that this discussion focuses on CEOs' incentives to meet short-term performance targets due to job security concerns. At the same time, CEOs might have incentives to meet short-term performance targets in order to move upward, i.e., move to a larger firm with potentially higher compensation. This scenario is more likely to occur in homogenous industries because the CEO's skill is more valuable for similar firms. We investigate such possibilities by separately examining CEO turnovers for better performing and poorly performing CEOs in our sample. We find that for better performing CEOs, the association between CEO turnover and performance is insignificant and does not vary with industry homogeneity. This result could be due to firms' efforts to retain better performing CEOs or other factors affecting CEO upward mobility (such as a firm's long-term strategy and CEO adaptability). In contrast, for poorly performing CEOs, the association between CEO turnover and performance is significantly negative and the association is stronger for more homogeneous industries, consistent with the arguments and findings in Parrino (1997). Therefore, we infer that CEOs' job dismissal concerns, compared with their incentives to move upward, are more likely to contribute to CEOs' strong incentives to meet short-term performance targets in homogenous industries.

Shareholders' Investment Horizon

One of the underlying reasons for managerial short-termism is the fixation of capital market participants on short-term performance. For example, the Aspen Institute (2009) report, *Overcoming Short-Termism: A Call for a More Responsible Approach to Investment and Business Management,* argues that the focus on the short-term trading gains of fund managers and the focus on the quarterly earnings of investors with short investment horizons can lead executives to pursue strategies that please these fund managers and investors, but jeopardize the company's long-term value maximization. Shleifer and Vishny (1990) show analytically that shareholders with short investment horizons can induce managers to focus on short-term performance. Empirically, Bushee (1998) documents that transient institutional investors, who have short investment horizons, are more likely to induce managers' myopic behavior. Without contractual protection, CEOs in firms with higher transient institutional ownership are under greater pressure to deliver short-term performance given the extensive evidence that CEOs' welfare (e.g., reputation, compensation, and job security) is positively correlated with stock market performance. Thus, we expect that CEO contractual protection is more important in curbing CEOs' myopic behavior in firms with higher transient institutional ownership. This discussion leads to our fourth hypothesis:

> **H4:** *Ceteris paribus,* the moderating effect of CEO contractual protection on the extent of myopic behavior, as hypothesized in H1, is stronger in firms with higher transient institutional ownership than in other firms.

Board Monitoring

If board monitoring and CEO contractual protection are alternative mechanisms for addressing managerial short-termism, then CEO contractual protection will be less important in the presence of more effective board monitoring, and *vice versa.*[10] Prior studies have shown that the effectiveness of board monitoring increases with board independence. For example, board independence can reduce managerial myopia, and firms increase board independence in response to managerial myopia (e.g., Klein 2002; Farber 2005; Srinivasan 2005). Thus, we use board independence to proxy for the effectiveness of board monitoring, and our fifth hypothesis is stated as follows:

> **H5:** *Ceteris paribus,* the moderating effect of CEO contractual protection on the extent of myopic behavior, as hypothesized in H1, is stronger in firms with lower board independence than in other firms.

III. SAMPLE AND RESEARCH DESIGN

Sample and Data

Our sample includes S&P 500 firms over the 1995–2008 period. The Securities and Exchange Commission (SEC) requires that companies disclose material employment agreements and severance pay agreements with top executives in their proxy statements (Regulation S-K, 17 CFR 299.601). For each firm-year, we hand-collect information on such CEO agreements from the proxy statements. Table 1, Panel A describes our sample selection process. We start with 6,973 firm-years that have proxy statements available from EDGAR. As mentioned earlier, our main proxy for

---

[10] As reported in Section IV, we find that the likelihood of CEO contractual protection is higher in firms with lower board independence, supporting the notion that CEO contractual protection and board monitoring are substitutes in addressing managerial short-termism.

TABLE 1

Sample Selection, Composition, and Descriptive Statistics

Panel A: Sample Selection

Restriction		Sample Size
Firm-years with proxy statements available from EDGAR for S&P 500 firms in the 1995–2008 period		6,973
Less:		
Firm-years with missing R&D data in the current year	3,119	
Firm-years with missing or insignificant R&D in the previous year (i.e., R&D/Sales < 1%)	1,169	
Firm-years without the data to calculate the regression variables	658	
Final sample		2,027

This panel reports the sample selection for our sample of 2,027 firm-years from S&P 500 firms in the 1995–2008 period.

Panel B: Yearly Distribution

Year	# of Obs.	# of Obs. with CEO Protection	Percentage of Obs. with CEO Protection	Type of CEO Protection	
				# of Obs. with Employment Agreements	# of Obs. with *Standalone* Severance Pay Agreements
1995	108	71	65.74%	30	41
1996	122	75	61.48%	34	41
1997	127	73	57.48%	32	41
1998	141	87	61.70%	43	44
1999	149	92	61.74%	52	40
2000	150	102	68.00%	54	48
2001	154	110	71.43%	63	47
2002	154	112	72.73%	63	49
2003	159	116	72.96%	60	56
2004	158	117	74.05%	67	50
2005	154	118	76.62%	67	51
2006	149	117	78.52%	58	59
2007	156	124	79.49%	58	66
2008	146	115	78.77%	55	60
Total	2,027	1,429	70.50%	736	693

This panel reports yearly distribution for our sample of 2,027 firm-years from S&P 500 firms in the 1995–2008 period.

Panel C: Descriptive Statistics on Firm Characteristics: Separately for Firm-Years With and Without CEO Protection

	n	Mean	Std. Dev.	Q1	Median	Q3
The sample with CEO protection						
Indicator for cutting R&D	1,429	0.365	0.482	0	0	1
Previous year's change in R&D	1,429	0.011	0.294	−0.079	0.054	0.148
Change in industry R&D intensity	1,429	0.003	0.147	−0.070	−0.004	0.075
Change in GDP	1,429	0.026	0.018	0.014	0.029	0.037

(continued on next page)

TABLE 1 (continued)

	n	Mean	Std. Dev.	Q1	Median	Q3
Tobin's Q	1,429	2.457	1.733	1.286	1.878	2.998
Change in capital expenditures	1,429	−0.004	0.431	−0.119	0.010	0.127
Change in sales	1,429	0.014	0.263	−0.017	0.033	0.083
Firm size	1,429	8.906	1.146	8.011	8.818	9.626
Distance from earnings goal	1,429	0.144	1.680	−0.658	0.304	0.982
Leverage	1,429	0.210	0.143	0.100	0.208	0.301
Free cash flows	1,429	0.280	0.212	0.157	0.262	0.391
Institutional ownership	1,429	0.709	0.157	0.625	0.732	0.820
CEO age dummy	1,429	0.110	0.313	0.000	0.000	0.000
CEO equity incentives	1,429	0.016	0.022	0.004	0.009	0.018
CEO abnormal compensation	1,429	0.095	0.456	−0.192	0.101	0.389
The sample without CEO protection						
Indicator for cutting R&D	598	0.426**	0.495	0	0**	1
Previous year's change in R&D	598	0.006	0.316	−0.113	0.055	0.154
Change in industry R&D intensity	598	0.012	0.147	−0.060	0.000	0.080
Change in GDP	598	0.030**	0.019	0.019	0.030**	0.040
Tobin's Q	598	3.190**	2.012	1.664	2.658**	4.019
Change in capital expenditures	598	−0.014	0.460	−0.149	0.008	0.132
Change in sales	598	−0.007	0.302	−0.059	0.030	0.087
Firm size	598	9.526**	1.334	8.440	9.454**	10.573
Distance from earnings goal	598	0.073	1.457	−0.630	0.221	0.831
Leverage	598	0.188**	0.166	0.019	0.178**	0.296
Free cash flows	598	0.301	0.217	0.178	0.307**	0.418
Institutional ownership	598	0.638**	0.162	0.532	0.657**	0.761
CEO age dummy	598	0.144	0.351	0.000	0.000	0.000
CEO equity incentives	598	0.026**	0.056	0.003	0.007**	0.018
CEO abnormal compensation	598	−0.102**	0.603	−0.315	0.021**	0.234

** Denotes a significant difference in the mean/median for firm-years with and without CEO protection at the 0.05 level.
This panel reports the descriptive statistics for our sample of 2,027 firm-years from S&P 500 firms in the 1995–2008 period, separately for firm-years with and without CEO protection.
Please see Appendix A for variable measurement.

Panel D: Descriptive Statistics on Firm Characteristics: Separately for the Small Earnings Decrease (SD), Large Earnings Decrease (LD), and Earnings Increase (IN) Groups

	Mean			p-value for the Difference in Means	
	SD	LD	IN	SD vs. LD	SD vs. IN
Indicator for cutting R&D	0.517	0.690	0.237	0.001	0.001
Previous year's change in R&D	0.038	0.024	−0.005	0.505	0.011
Change in industry R&D intensity	0.013	0.023	−0.003	0.329	0.052
Change in GDP	0.027	0.027	0.027	0.596	0.684
Tobin's Q	2.695	2.436	2.742	0.071	0.678
Change in capital expenditures	−0.063	−0.187	0.070	0.001	0.001
Change in sales	−0.062	−0.202	0.100	0.001	0.001
Firm size	9.061	8.987	9.132	0.399	0.309
Distance from earnings goal	−0.438	−2.317	1.104	0.001	0.001
Leverage	0.190	0.228	0.200	0.001	0.198
Free cash flows	0.245	0.242	0.315	0.835	0.001

(continued on next page)

TABLE 1 (continued)

	Mean			p-value for the Difference in Means	
	SD	LD	IN	SD vs. LD	SD vs. IN
Institutional ownership	0.680	0.657	0.700	0.051	0.032
CEO age dummy	0.123	0.132	0.115	0.707	0.658
CEO equity incentives	0.022	0.019	0.018	0.215	0.023
CEO abnormal compensation	0.003	−0.027	0.070	0.298	0.023

This panel reports the descriptive statistics for our sample of 2,027 firm-years from S&P 500 firms in the 1995–2008 period, separately for the three groups. The small earnings decrease (SD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is smaller than the previous year's R&D. The large earnings decrease (LD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is greater than the previous year's R&D. The earnings increase (IN) group includes firm-years in which there is an increase in the pre-tax, pre-R&D earnings from the previous year to the current year. The last two columns report the p-values for the differences in means between the SD and LD groups and between the SD and IN groups.
Please see Appendix A for variable measurement.

managerial myopia is whether CEOs cut R&D expenditures. We drop the firm-years that have missing or insignificant R&D expenditures. Specifically, we require that the firm have non-missing R&D in the current year and R&D expenditures greater than 1 percent of sales in the previous year.[11] We exclude firm-years that do not have the data to calculate the regression variables. Our final sample consists of 2,027 firm-years.

Table 1, Panel B presents the sample distribution by year. On average, 70.5 percent of the sample firm-years have CEO contractual protection.[12] The percentage of firms with CEO protection increases steadily over time, from around 60 percent in the mid-1990s to more than 75 percent in the last several years of the sample period.[13,14]

Table 1, Panel C reports the descriptive statistics on firm characteristics, separately for firm-years with and without CEO contractual protection. The two groups of firms do not significantly

---

[11] We impose these restrictions to increase the power of tests. First, we require significant R&D expenditures in the previous year, because cutting R&D expenditures to improve short-term performance is not meaningful for firms with insignificant R&D expenditures. Second, we require non-missing R&D in the current year (instead of significant R&D) to allow for the possibility that the firm has cut R&D in the current year to achieve earnings goals. The restriction of non-missing R&D in the current year may bias against finding results, because it can lead to the omission of observations where CEOs cut R&D to zero. To address this issue, we do not impose any restriction on the current year's R&D (assuming missing R&D as zero) and replicate the analyses. The untabulated results are quantitatively similar.

[12] This percentage is higher than that reported previously because prior research focuses on either employment agreements or standalone severance pay agreements, not both. About 36 percent of our sample firm-years have CEO employment agreements and about 34 percent have standalone CEO severance pay agreements. Note that the two types of contractual protection are exclusive; firms with contractual protection include those with employment agreements, which almost always include a termination/severance pay term, and those with *standalone* severance pay agreements.

[13] The increasing prevalence of CEO protection over time can be due to the increasing uncertainty of the business environment. The results are robust to the inclusion of year fixed effects in the regressions. The percentage of firms with CEO protection also varies across industries. For instance, while about 91 percent of the firms in the Construction Materials industry have CEO protection, only about 59 percent of the firms in the Computers industry have CEO protection. The results are robust to the inclusion of industry fixed effects in the regressions.

[14] We find a high concentration of firms with headquarters in the state of Delaware. However, there is no significant difference in the percentage of Delaware firms with and without CEO protection. The inclusion of an indicator for Delaware firms in the regressions leads to quantitatively similar results.

differ, except that firms without CEO protection are larger and have higher Tobin's Q, lower leverage, lower institutional ownership, higher CEO equity incentives, and lower CEO abnormal compensation. We control for all of these characteristics in our analyses.

Research Design

Following previous studies (Baber et al. 1991; Bushee 1998), we use the likelihood of cutting R&D to capture the extent of managerial myopia. H1 predicts that CEO contractual protection helps to alleviate managerial myopia and reduce managers' tendency to cut R&D. To test H1, we estimate the following probit regression:

$$
\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = {} & \alpha + \beta CEO\_Protection_{i,t} + \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t} \\
& + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} \\
& + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} \\
& + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} + \gamma_{13} CEO\_Equity_{i,t} \\
& + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t},
\end{aligned}
\tag{1}
$$

where $RD\_Decrease_{i,t}$ is an indicator for cutting R&D, which equals 1 if R&D decreases for firm i in year t compared to the previous year, and 0 otherwise; $CEO\_Protection_{i,t}$ is an indicator for CEO contractual protection, which equals 1 if the CEO has an employment agreement or a standalone severance pay agreement, and 0 otherwise. H1 implies that β is negative. The variable measurements follow Bushee (1998) and are described in Appendix A. The standard errors are adjusted for firm and year clustering.

Following Bushee (1998), we control for factors that may affect R&D investments and, hence, the likelihood of cutting R&D. The previous year's change in R&D (ΔRD) captures the trend in R&D investments. A continuation of the trend implies a negative coefficient on this variable, whereas a reversal of the trend implies a positive coefficient. The change in industry R&D intensity (ΔInd_RD) and the change in GDP (ΔGDP) capture the R&D investment opportunities at the industry and economy levels, respectively. Tobin's Q ($Tobin\_Q$), the change in capital expenditures ($\Delta CAPX$), and the change in sales ($\Delta Sales$) capture the firm's growth opportunities. The investment opportunity and growth opportunity variables are predicted to be negatively associated with the likelihood of cutting R&D. Firm size ($Size$) captures cash constraints. Smaller firms are more likely to suffer cash shortages that can lead them to cut R&D. Thus, the coefficient on $Size$ is predicted to be negative. The distance from earnings goal ($Distance\_Goal$) captures the change in pre-tax, pre-R&D earnings. The more negative this variable is, the more difficult it is for the firm to meet its earnings goals by cutting R&D and, thus, the less likely it is that the firm will do so. This implies a positive coefficient on $Distance\_Goal$. Leverage ($Leverage$) captures the firm's incentives to increase earnings to reduce debt contracting costs and is predicted to be positively correlated with the likelihood of cutting R&D. Free cash flows (FCF) captures the availability of funds and is predicted to be negatively correlated with the likelihood of cutting R&D. Institutional ownership ($INST$) captures the monitoring by institutional investors and is predicted to have a negative coefficient.

We also control for three variables related to CEO incentives. First, Dechow and Sloan (1991) find that CEOs who are closer to retirement are more myopic and, thus, are more likely to cut R&D. Accordingly, we include an indicator for CEOs who are 63 or older (CEO_Age). Second, prior studies (e.g., Dechow and Sloan 1991; Cheng 2004) find that equity incentives can reduce managers' tendency to engage in myopic behavior. Thus, we control for CEOs' equity incentives (CEO_Equity). Finally, more capable CEOs may be less likely to resort to cutting R&D to achieve earnings targets because they are more confident in improving firm performance and/or less concerned with being replaced. Following Gillan et al. (2009), we use CEOs' abnormal compensation ($CEO\_Abnormal\_Comp$) to proxy for CEO ability.

While Regression (1) tests the average effect of CEO protection on cutting R&D, the effect of CEO protection is likely to be stronger when CEOs have particularly strong incentives to engage in myopic behavior. Following Baber et al. (1991) and Bushee (1998), we focus on the firm-years in which managers have strong incentives to cut R&D to avoid earnings decreases. We split the sample into three groups. We compare the pre-tax, pre-R&D earnings of the current year (i.e., the sum of pre-tax earnings and R&D expenditures) with that of the previous year.[15] If there is a decrease in the pre-tax, pre-R&D earnings, but the decrease is smaller than the previous year's R&D, then the firm can potentially avoid an earnings decrease by cutting R&D. This group of firm-years is referred to as the small earnings decrease (SD) group.[16,17] Baber et al. (1991) and Bushee (1998) argue that within the SD group, myopic managers have strong incentives to cut R&D to avoid earnings decreases. The rest of the sample falls into two groups: the large earnings decrease (LD) group and the earnings increase (IN) group. The LD group includes the firm-years in which the pre-tax, pre-R&D earnings fall short of the previous year's by an amount greater than the previous year's R&D. Firms in this group will not be able to avoid earnings declines by cutting R&D. The IN group includes the firm-years in which the pre-tax, pre-R&D earnings exceed those of the previous year. Firms in this group do not need to cut R&D to report an increase in earnings. Therefore, managers in these two groups do not have strong incentives to cut R&D to achieve short-term earnings goals, although they might do so for other reasons (e.g., due to lack of economic resources in the case of the LD group). If, as we hypothesize, CEO contractual protection affects the likelihood of cutting R&D through its effect on managerial myopia, then we expect the effect of CEO protection to be stronger for the SD group than for the LD or IN groups.

Panel D of Table 1 provides the descriptive statistics on the regression variables, separately for the three groups of firms, and the p-values for the differences in means between the SD group and the other two groups. For almost all of the variables, the mean for the SD group lies between those of the LD and IN groups, consistent with the performance ranking of the three groups. Note that we control for all of these variables in the regressions.

IV. DETERMINANTS OF CEO CONTRACTUAL PROTECTION AND CONTROLLING FOR ENDOGENEITY

In this section, we first build on prior research and investigate why some firm-years have CEO contractual protection and others do not. Based on this investigation, we then discuss how we address the endogeneity of CEO contractual protection in the main analyses.

Determinants of CEO Contractual Protection

Whether a firm has CEO contractual protection is not random; rather, it is the outcome of the bilateral negotiation between the firm and the CEO. As discussed in Section II, CEO protection is

---

[15] Specifically, the pre-tax, pre-R&D earnings are the sum of pre-tax income (Compustat item PI) and R&D expenditures. According to the Compustat manual, PI excludes minority interest, extraordinary items, and discontinued operations. In an untabulated analysis, we calculate the pre-tax, pre-R&D earnings as the sum of income before extraordinary items, tax expenses, and R&D expenditures. The results are quantitatively similar.

[16] One potential complication is the effect of the R&D tax credit. Bushee (1998) finds that the sample classification after considering the estimated R&D tax credit is highly correlated with the original sample classification. Note that the misclassification of the SD group is likely to bias against finding results consistent with our prediction. In addition, we hand-collect information on R&D tax credit from the income tax footnotes in the financial statements. In untabulated analyses, we exclude either (1) firm-years with a large R&D tax credit (greater than 0.25 percent of sales), or (2) firm-years with any non-zero R&D tax credit. The results are quantitatively similar. A caveat is that R&D tax credit obtained from the income tax footnotes may still contain measurement error.

[17] Note that the decrease here refers to the decrease in the pre-tax, pre-R&D earnings, not the decrease in the actual earnings. We use the same terms as in Bushee (1998) for consistency.

costly to the firm because it increases the cost of renegotiating with and terminating the CEO. However, the firm also has incentives to offer CEO protection to attract desirable candidates and to incentivize the CEO to undertake long-term, risky projects and invest in firm-specific human capital. CEOs, meanwhile, have incentives to require contractual protection, especially when the likelihood of being replaced is high. CEOs with a favorable bargaining position, such as those with higher ability, are also more likely to have contractual protection.

We follow previous studies in choosing the explanatory variables for CEO contractual protection. First, we search the literature to identify variables that capture firms' incentives to offer and CEOs' incentives to require contractual protection (Knoeber 1986; Almazan and Suarez 2003; Rusticus 2006; Yermack 2006; Gillan et al. 2009; Rau and Xu 2013):

(1) Uncertainty over the firm-CEO fit. Uncertainty about the fit between a firm and its CEO is higher for firms with uncertain business environments or CEOs with limited experience. In such cases, CEOs are more likely to be replaced and, hence, are more likely to demand contractual protection. Following prior research, we use R&D intensity, growth opportunities (proxied by the market-to-book ratio), and performance (proxied by market-adjusted returns and return on assets [ROA]) to capture uncertainty in the business environment. We use an indicator for outside CEOs to capture CEOs' lack of experience in running the firm. We expect positive coefficients on R&D intensity, the market-to-book ratio, and the indicator for outside CEOs, and negative coefficients on market-adjusted returns and ROA.

(2) CEOs' potential monetary loss from being replaced. Contractual protection is more important for CEOs who have more to lose from being replaced. CEOs have more to lose when they have more years until retirement, higher compensation, or more incentive-based compensation (unvested options/stocks will be forgone upon the CEO's replacement). Thus, we expect the use of contractual protection to decrease with the CEO's age, but to increase with abnormal compensation and incentive-based compensation.

(3) Alternative mechanisms to address CEO short-termism.[18] As discussed above, CEO contractual protection can address short-termism. Such benefits are lower when there are alternative ways to do so or when CEOs are less likely to be myopic. Prior research shows that CEOs in firms with more independent boards and founder CEOs are less likely to be myopic (e.g., S. Chen, X. Chen, and Cheng 2008; Duchin, Matsusaka, and Ozbas 2010). As such, we expect the likelihood of using CEO contractual protection to be lower when board independence is higher and when the CEO is a founder.

In addition, we control for leverage and firm size (proxied by total assets); we do not make directional predictions for these two variables.[19]

Second, we consider the effect of state contracting laws. Prior research indicates that the design of employment contracts is influenced by state laws on exceptions to employment at will (e.g., Muhl 2001; Autor, Donohue, and Schwab 2004). States can adopt one or more of the three

---

[18] How firms choose among alternative mechanisms to address CEO short-termism (including different forms of CEO contracts, such as CEO employment agreements or standalone severance pay agreements) is likely to depend on the benefits and costs of various mechanisms. We leave this for future research.

[19] Note that the above list includes the most important determinants of CEO contractual protection based on prior studies. It is by no means a complete list. Also note that some predicted associations may be consistent with alternative interpretations. For example, the predicted negative association between CEO protection and board independence and the predicted positive association between CEO protection and CEO compensation are also consistent with CEOs extracting rents through contractual protection and CEOs who are in a more favorable bargaining position being more likely to have contractual protection (e.g., Bebchuk and Fried 2004). We refer readers to prior studies for more detailed discussions.

commonly used exceptions that limit employers' ability to fire employees at will: public policy, implied contract, good faith, and fair dealing. Under the "public policy" exception, the employer may not fire the employee if the dismissal violates the state's public policy. Under the "implied contract" policy, the employer may not fire the employee if an implied contract is formed between the two parties. The "good faith and fair dealing" exception means that employers cannot fire employees in bad faith, such as to deprive employees of their benefits. With these exceptions, employees are better protected from dismissal and, as such, the importance of CEO contractual protection is lower, leading to a lower likelihood of CEO protection.[20]

We also consider two other state policies: anti-takeover regulations and the enforcement of non-competition agreements. In states with anti-takeover regulations, firms are less likely to be acquired through hostile takeovers. As CEOs are often replaced after hostile takeovers, CEOs in states with anti-takeover regulations are better protected from takeover pressure (e.g., Bertrand and Mullainathan 1999, 2003) and, thus, CEO protection becomes less important. Garmaise (2011) finds that in states where non-competition agreements are better enforced, executive stability increases. CEOs are less likely to move to competitor firms and are also less worried about being replaced by executives from competitors. As such, firms in these states are less likely to have CEO contractual protection.

We estimate a probit regression of the likelihood of CEO contractual protection on the above determinants. Table 2 provides the variable measurements and regression results. Because there is a significant variation in the use of CEO protection across industries, we estimate the regressions by industry to improve the goodness of fit of the model. Table 2 reports the average coefficients and their p-values across industries.[21]

The results are generally consistent with the predictions. The likelihood of CEO protection increases with R&D intensity and decreases with performance; CEO protection is less likely when the CEO is older, when board independence is higher, and when the CEO is a founder, and is more likely for CEOs with higher abnormal compensation and incentive-based compensation. With respect to the state variables, the likelihood of CEO protection is lower in states that provide better protection to employees, have anti-takeover regulations, and better enforce non-competition agreements. The marginal effects indicate that the explanatory variables have an economically significant effect on the use of CEO protection.

Overall, the results indicate that the use of CEO contractual protection is systematically affected by uncertainty in the business environment, the CEO's potential loss from being replaced, alternative mechanisms used to address managerial short-termism, and state laws.

Controlling for the Endogeneity of CEO Contractual Protection

As certain firm and CEO characteristics can be correlated with both the use of CEO protection and managerial short-termism (as proxied by the likelihood of cutting R&D to meet earnings targets), we use two approaches to address the potential endogeneity of CEO protection. First, in Regression (1), we replace the CEO protection indicator with its predicted value estimated from the model of determinants of CEO protection. Second, we add to Regression (1) the inverse Mills ratio

---

[20] This discussion suggests that even CEOs without contractual protection may have implicit protection, for example, from state contracting laws. Contractual protection is likely to be superior to state provisions in protecting CEOs, because contractual protection is more explicit and more specific to the CEO. In our sensitivity tests, we explicitly control for state contracting laws and state policies when testing our hypotheses. Our inferences remain the same. The state variables are mostly insignificant.

[21] The sample used in this table includes 2,977 firm-years. The number of firm-years is larger than that in the main analyses because we do not require that R&D is non-missing and of a significant amount. We drop the firm-years in industries with too few observations to estimate the regressions.

TABLE 2

Determinants of the Use of CEO Contractual Protection

Panel A: Variable Measurements

Variable		Definition
Firm and CEO characteristics		
R&D Intensity	=	R&D expenditures divided by sales, and set as 0 for missing values;
Market-to-book ratio	=	market value of equity divided by book value of equity;
Market-adjusted returns	=	market-adjusted cumulative stock returns over the year;
ROA	=	return on assets, measured as net income over total assets;
Outside CEO	=	1 if the CEO was appointed to the CEO position within one year after joining the firm, and 0 otherwise;
Old CEO	=	1 if the CEO is 63 or older, and 0 otherwise;
Abnormal compensation	=	abnormal CEO cash compensation, measured as the residual from a model that regresses the logarithm of CEO cash compensation on the logarithm of firm assets, ROA, the market-to-book ratio, CEO tenure, and industry and year indicators, as in Gillan et al. (2009);
Incentive-based compensation	=	the ratio of the value of the CEO's stock and option grants to the CEO's total compensation;
Board independence	=	1 if the percentage of independent directors sitting on the board is higher than the sample median, and 0 otherwise;
Founder CEO	=	1 if the CEO is one of the founders of the firm, and 0 otherwise;
Leverage	=	total debt divided by total assets;
Assets	=	logarithm of total assets (in millions);
State policy variables		
Public policy	=	1 for firms with headquarters in the states that have a public policy exception for employment at will, and 0 otherwise;
Implied contract	=	1 for firms with headquarters in the states that have an implied contract exception for employment at will, and 0 otherwise;
Good faith and fair dealing	=	1 for firms with headquarters in the states that have a good faith and fair dealing exception for employment at will, and 0 otherwise;
Anti-takeover regulations	=	1 for firms with headquarters in the states that have business combination laws (Bertrand and Mullainathan 1999), and 0 otherwise; and
Garmaise index	=	the state-level enforcement index of non-competition agreements, as constructed by Garmaise (2011).

Panel B: Results from Probit Regressions

	Pred. Signs	Coeff.	p-value	Marginal Effect
Intercept		18.864	0.028	
Firm and CEO characteristics				
R&D intensity	+	9.091	0.040	0.068
Market-to-book ratio	+	2.530	0.179	0.044
Market-adjusted returns	−	0.961	0.862	0.030
ROA	−	−17.790	0.025	−0.085
Outside CEO	+	−1.130	0.871	−0.080
Old CEO	−	−2.556	0.005	−0.152
Abnormal compensation	+	2.788	0.001	0.094
Incentive-based compensation	+	2.528	0.014	0.076

TABLE 2 (continued)

	Pred. Signs	Coeff.	p-value	Marginal Effect
Board independence	–	−0.857	0.028	−0.066
Founder CEO	–	−2.697	0.001	−0.177
Leverage	?	2.909	0.115	0.041
Assets	?	−0.820	0.205	−0.036
State policy variables				
Public policy	–	1.602	0.917	0.088
Implied contract	–	−2.356	0.015	−0.142
Good faith and fair dealing	–	−2.623	0.022	−0.159
Anti-takeover regulations	–	−1.031	0.048	−0.076
Garmaise index	–	−0.607	0.063	−0.051
# of observations		2,977		
# of industries		30		
Average pseudo R^2		0.595		

This table reports the results from the probit regressions that explain the likelihood of a firm having CEO contractual protection (i.e., having an employment agreement or a standalone severance pay agreement with the CEO). The sample includes 2,977 firm-years from S&P 500 firms in the 1995–2008 period. We require that the proxy statement is available from EDGAR and data are available to calculate the regression variables. (The sample size is larger than that in the main analyses because here we do not require that R&D is non-missing and of a significant amount in the current or previous year.) The probit regression is estimated by industry (based on Fama and French [1997] industry definitions). We report the average coefficients and marginal effects across industries and the p-values based on the coefficient estimates across industries. p-values are one-sided for variables with predicted signs, and two-sided otherwise. The marginal effect is calculated as the change in the probability of having CEO contractual protection, when there is a change of one standard deviation in the continuous explanatory variables (or a change from 0 to 1 in the indicator variables), with other explanatory variables taking the value of the sample means.

estimated from the determinant model (Heckman 1979). Both approaches are widely used in the literature to address endogeneity (e.g., Doidge et al. 2004). Note that the state policy variables are *exogenous* instrumental variables. We conduct the tests recommended by Larcker and Rusticus (2010) and find that the state policy variables are valid and effective instruments.[22]

V. MAIN ANALYSES AND CROSS-SECTIONAL TESTS

CEO Contractual Protection and Managerial Short-Termism—Univariate Analyses

Table 3 reports the univariate analysis results. H1 predicts that CEO contractual protection will reduce CEOs' incentives to engage in myopic behavior, implying a negative correlation between CEO protection and the likelihood of cutting R&D. The results reported in Panel A are consistent with this prediction. While 43 percent of the firm-years without CEO protection cut R&D, only 37 percent of the firm-years with CEO protection do so. The difference of six percentage points is both economically and statistically significant (p-value of the Chi-square test = 0.009).

---

[22] First, the F-test rejects the null hypothesis that the state policy variables are not correlated with the use of CEO protection at the 0.001 level. The F-statistic is 24.21, higher than the recommended critical value of 15.09 in the case of five instruments. This suggests that the instruments are effective. Second, the over-identification test fails to reject the null hypothesis that the instruments are not correlated with the second-stage regression residuals. The J-statistic is 1.45, while the critical value for the 10 percent significance level is 7.78 (Chi-square distribution with four degrees of freedom; the degree of freedom is the number of instrumental variables minus the number of endogenous variables). This indicates that the instruments are valid (i.e., exogenous). See Larcker and Rusticus (2010) for more detailed discussions of these tests.

TABLE 3

CEO Contractual Protection and Managerial Short-Termism
Univariate Analysis

Panel A: The Analysis for the Full Sample (n = 2,027)

	Without CEO Protection	With CEO Protection	Total
Cut R&D	255	522	777
(% of firms cutting R&D)	(43%)	(37%)	(38%)
Increase R&D	343	907	1,250
(% of firms increasing R&D)	(57%)	(63%)	(62%)
p-value of Chi-square test		0.009	

Panel B: The Analysis Separately for the Three Groups

	Without CEO Protection	With CEO Protection	Total
The small earnings decrease (SD) group (n = 431)			
Cut R&D	97	126	223
(% of firms cutting R&D)	(65%)	(45%)	(52%)
Increase R&D	52	156	208
(% of firms increasing R&D)	(35%)	(55%)	(48%)
p-value of Chi-square test		0.001	
The large earnings decrease (LD) group (n = 387)			
Cut R&D	75	192	267
(% of firms cutting R&D)	(71%)	(68%)	(69%)
Increase R&D	31	89	120
(% of firms increasing R&D)	(29%)	(32%)	(31%)
p-value of Chi-square test		0.645	
The earnings increase (IN) group (n = 1,209)			
Cut R&D	83	204	287
(% of firms cutting R&D)	(24%)	(24%)	(24%)
Increase R&D	260	662	922
(% of firms increasing R&D)	(76%)	(76%)	(76%)
p-value of Chi-square test		0.813	

The sample includes 2,027 firm-years from S&P 500 firms over the 1995–2008 period. CEO protection refers to CEO contracts in the form of employment agreements or standalone severance pay agreements. Panel A reports the results for the full sample, and Panel B reports the results separately for the three groups. The small earnings decrease (SD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is smaller than the previous year's R&D. The large earnings decrease (LD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is greater than the previous year's R&D. The earnings increase (IN) group includes firm-years in which there is an increase in the pre-tax, pre-R&D earnings from the previous year to the current year.

As discussed earlier, we expect the effect of CEO protection on managerial short-termism to be particularly strong for the small earnings decrease (SD) group, relative to the large earnings decrease (LD) or the earnings increase (IN) group. Panel B of Table 3 reports the analysis separately for the three groups. The results are consistent with our expectation. For the SD group, while 65 percent of the firm-years without CEO protection cut R&D, only 45 percent of the firm-

years with CEO protection do so. The difference of 20 percentage points is both economically and statistically significant (p-value of the Chi-square test = 0.001). In contrast, in the LD group, the likelihood of cutting R&D is 68 percent and 71 percent for firms with and without CEO protection, respectively (p-value of the Chi-square test = 0.645).[23] In the IN group, the likelihood of cutting R&D is about the same, 24 percent, for firms with and without CEO protection.[24]

In sum, the univariate analyses provide evidence consistent with H1. Furthermore, the results are driven by the SD group, where the incentives of managerial short-termism are particularly strong. Next, we report the multivariate analyses that control for potential confounding factors and the endogeneity of CEO contractual protection.

CEO Contractual Protection and Managerial Short-Termism—Multivariate Analyses

In this section, we use regression analyses to examine the effect of CEO contractual protection on the likelihood of cutting R&D, first for the full sample and then separately for the three groups. Table 4 reports the results for the full sample. To address the endogeneity of CEO protection, in Column (1), we use the predicted value of CEO protection from the first-stage regression, and in Column (2), we use the Heckman (1979) approach and include the inverse Mills ratio estimated from the first-stage regression. The inferences remain the same when we do not control for endogeneity.

Table 4, Column (1) shows that CEO contractual protection significantly reduces the likelihood of cutting R&D (p-value = 0.010). The marginal effect of CEO protection is −7.1 percentage points. This effect is economically significant given that the probability of cutting R&D in the sample without CEO protection is about 43 percent (Table 3, Panel A). In Column (2), the result for CEO protection is similar; the coefficient is negative with a p-value of 0.005, and the marginal effect is −8.2 percentage points.

With respect to firm-level control variables, we find that change in industry R&D intensity, change in capital expenditures, change in sales, firm size, and distance from earnings goal are negatively correlated with the likelihood of cutting R&D, suggesting that the likelihood of cutting R&D is lower when there are more investment and growth opportunities. The previous year's change in R&D has a positive effect, consistent with mean reversion in R&D investments. With respect to CEO characteristics, we find that CEO equity incentives are negatively correlated with the likelihood of cutting R&D, which suggests that CEOs whose interests are better aligned with shareholders' are less likely to engage in myopic behavior (e.g., Cheng 2004).[25] The other control variables have insignificant coefficients.

To examine the differential effect of CEO protection for the three groups, we expand Regression (1) by including the indicators for the three groups and their interactions with *CEO_ Protection*. The regression specification is as follows:

---

[23] The higher likelihood of cutting R&D in the LD group is likely driven by the poor performance and lack of economic resources among these firms.

[24] The insignificant findings for the LD and IN groups help to alleviate the concern that the finding for the SD group is driven by omitted firm or CEO characteristics that are correlated with both R&D investments and CEO contractual protection. For example, if CEOs with contractual protection tend to invest more in R&D, and if this general tendency drives the lower likelihood of cutting R&D for firms with CEO protection in the SD group, then we should observe similar results in the other two groups.

[25] The result for CEO equity incentives is robust to the exclusion of the CEO contractual protection and CEO age variables, which are positively correlated with CEO equity incentives. While the literature provides mixed evidence on whether equity incentives help to alleviate managerial short-termism (e.g., Cheng and Warfield 2005; Erickson et al. 2006; Efendi et al. 2007; Armstrong, Jagolinzer, and Larcker 2010), the negative coefficient on CEO equity incentives here is consistent with equity compensation helping to address managerial myopia.

none

TABLE 4

CEO Protection and Managerial Short-Termism
Regression Analyses for the Full Sample

	(1) Using the Predicted Value of CEO Protection			(2) Using the Heckman Approach		
	Coeff.	p-value	Marginal Effect	Coeff.	p-value	Marginal Effect
Intercept	0.742	0.051		0.760	0.004	
CEO_Protection	−0.188	0.010	−0.071	−0.215	0.005	−0.082
Previous year's change in R&D	0.585	0.001	0.067	0.584	0.001	0.067
Change in industry R&D intensity	−0.524	0.032	−0.029	−0.521	0.033	−0.029
Change in GDP	0.534	0.794	0.004	0.424	0.837	0.003
Tobin's Q	0.027	0.269	0.019	0.027	0.293	0.018
Change in capital expenditures	−0.611	0.001	−0.099	−0.613	0.001	−0.100
Change in sales	−0.959	0.001	−0.196	−0.959	0.001	−0.196
Firm size	−0.098	0.002	−0.045	−0.097	0.002	−0.045
Distance from earnings goal	−0.142	0.001	−0.086	−0.144	0.001	−0.087
Leverage	−0.043	0.884	−0.003	−0.068	0.818	−0.004
Free cash flows	0.339	0.111	0.028	0.343	0.107	0.028
Institutional ownership	−0.200	0.420	−0.012	−0.163	0.509	−0.010
CEO age dummy	0.021	0.851	0.008	0.021	0.853	0.008
CEO equity incentives	−4.561	0.037	−0.067	−4.644	0.033	−0.068
CEO abnormal compensation	−0.035	0.629	−0.007	−0.041	0.571	−0.008
Inverse Mills Ratio				−0.018	0.819	−0.003
n	1,761			1,761		
Pseudo R^2	0.205			0.207		

The sample includes 2,027 firm-years from S&P 500 firms over the 1995–2008 period. The following probit regression is estimated:

$$
\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = {} & \alpha + \beta CEO\_Protection_{i,t} + \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} \\
& + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} \\
& + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} + \gamma_{13} CEO\_Equity_{i,t} \\
& + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t},
\end{aligned}
\tag{1}
$$

where *RD_Decrease* is an indicator for cutting R&D; it equals 1 if the firm cuts R&D compared with the previous year, and 0 otherwise. *CEO_Protection* is an indicator for CEO contractual protection; it equals 1 if the CEO has an employment agreement or a standalone severance pay agreement, and 0 otherwise. In Column (1), we replace *CEO_ Protection* with its predicted value from the first-stage regression. In Column (2), we add to the regression the inverse Mills ratio estimated from the first-stage regression. See Table 2 for details of the first-stage regression. The p-values are based on standard errors adjusted for firm and year clustering. The p-values are one-sided for *CEO_Protection,* and two-sided otherwise. The marginal effect is calculated as the change in the probability of cutting R&D when there is a change of one standard deviation in the continuous explanatory variables (or a change from 0 to 1 in the indicator variables), with the other explanatory variables taking the value of the sample means.
See Appendix A for the measurement of the control variables.

$$
\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = {} & \alpha_1 SD_{i,t} + \alpha_2 LD_{i,t} + \alpha_3 IN_{i,t} + \beta_1 SD_{i,t} \times CEO\_Protection_{i,t} \\
& + \beta_2 LD_{i,t} \times CEO\_Protection_{i,t} + \beta_3 IN_{i,t} \times CEO\_Protection_{i,t} \\
& + \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} \\
& + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t} \\
& + \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} \\
& + \gamma_{13} CEO\_Equity_{i,t} + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} \\
& + \sum Control\ Variables_{i,t} \times LD_{i,t} \\
& + \sum Control\ Variables_{i,t} \times IN_{i,t} + \varepsilon_{i,t}. \quad\quad (2)
\end{aligned}
$$

The coefficient on the interaction term $SD \times CEO\_Protection$ ($LD \times CEO\_Protection$, $IN \times CEO\_Protection$) captures the effect of CEO contractual protection for the SD (LD, IN) group. Note that because the three indicator variables collectively cover all firm-years, Equation (2) does not include an intercept. To control for the potentially different effects of the control variables across the groups, we also include the interaction terms between the control variables and LD/IN. Thus, the coefficients on the control variables capture the effects of the control variables for the SD group. The coefficients on the interaction terms between the control variables and LD/IN capture the incremental effect of the control variables for the LD/IN groups; we do not report those coefficient estimates to save space.

Table 5 reports the regression results. The coefficient on $SD \times CEO\_Protection$ is significantly negative (p-value = 0.001), indicating that for firms in the SD group, those with CEO contractual protection are less likely to cut R&D. The marginal effect of CEO protection for the SD group ranges from 21.1 to 24.3 percentage points for the two specifications. In contrast, the coefficients on $LD \times CEO\_Protection$ and $IN \times CEO\_Protection$, although negative, are not statistically significant. The marginal effect of CEO protection is also quite small for the LD and IN groups: 3.5 and 4.5 percentage points for the LD group and 2.0 and 2.8 percentage points for the IN group. At the bottom of Table 5, we also compare the coefficient on $SD \times CEO\_Protection$ with those on $LD \times CEO\_Protection$ and $IN \times CEO\_Protection$. The differences are significantly different from zero; the p-values range from 0.005 to 0.046. This result indicates that, as expected, the effect of CEO protection is greater for the SD group than for the LD and IN groups.

In sum, we find that firms with CEO contractual protection are less likely to cut R&D than those without CEO contractual protection. This finding indicates that CEO contractual protection can reduce managerial short-termism. Furthermore, this effect is primarily driven by those firms where managers have particularly strong incentives to engage in myopic behavior; that is, the small earnings decrease (SD) group whose managers have strong incentives to cut R&D to avoid earnings decreases.

It is also interesting to examine the efficacy of CEO contractual protection for the SD group; that is, whether the effect of CEO contractual protection is strong enough to overcome managers' incremental incentives to cut R&D in the SD group. For this purpose, we follow Baber et al. (1991) and Bushee (1998) and use the other two groups combined as the benchmark. Specifically, we rerun Regression (2), but with the LD and IN groups combined. The untabulated analyses indicate that for firms without CEO contractual protection, the incremental effect of the SD group on the likelihood of cutting R&D is significantly positive, consistent with previous findings (Baber et al. 1991; Bushee 1998). However, for firms with CEO contractual protection, the incremental effect of the SD group on the likelihood of cutting R&D becomes insignificant. This result indicates that CEO contractual protection can effectively address the managerial myopia associated with the SD group.

Sensitivity Tests

We conduct a series of sensitivity tests, but for the sake of brevity, we do not tabulate the results:

TABLE 5

CEO Protection and Managerial Short-Termism
Regression Analyses for the Three Groups

	(1) Using the Predicted Value of CEO Protection			(2) Using the Heckman Approach		
	Coeff.	p-value	Marginal Effect	Coeff.	p-value	Marginal Effect
SD	1.464	0.077		1.502	0.069	
LD	1.211	0.226		1.219	0.215	
IN	0.585	0.318		0.621	0.293	
$SD \times CEO\_Protection$	−0.554	0.001	−0.211	−0.638	0.001	−0.243
$LD \times CEO\_Protection$	−0.092	0.329	−0.035	−0.118	0.285	−0.045
$IN \times CEO\_Protection$	−0.052	0.338	−0.020	−0.073	0.281	−0.028
Previous year's change in R&D	0.880	0.001	0.101	0.854	0.001	0.098
Change in industry R&D intensity	−0.752	0.148	−0.042	−0.727	0.167	−0.040
Change in GDP	−3.371	0.404	−0.024	−3.566	0.375	−0.026
Tobin's Q	0.055	0.232	0.038	0.057	0.216	0.039
Change in capital expenditures	−0.470	0.013	−0.077	−0.463	0.014	−0.076
Change in sales	−0.833	0.001	−0.172	−0.802	0.001	−0.166
Firm size	−0.109	0.096	−0.051	−0.114	0.078	−0.053
Distance from earnings goal	−0.021	0.936	−0.013	−0.031	0.904	−0.019
Leverage	−0.358	0.472	−0.021	−0.309	0.534	−0.018
Free cash flows	0.255	0.515	0.021	0.277	0.478	0.023
Institutional ownership	−0.381	0.465	−0.023	−0.294	0.567	−0.018
CEO age dummy	0.484	0.037	0.159	0.479	0.038	0.158
CEO equity incentives	−4.148	0.041	−0.061	−4.168	0.038	−0.061
CEO abnormal compensation	−0.353	0.095	−0.070	−0.373	0.075	−0.074
Inverse Mills Ratio				0.240	0.143	0.045
Control variables × *LD*	Yes			Yes		
Control variables × *IN*	Yes			Yes		
n	1,761			1,761		
Pseudo R^2	0.257			0.261		
p-values (one-sided) for the comparisons across the groups						
$SD \times CEO\_Protection = LD \times CEO\_Protection$	0.046			0.029		
$SD \times CEO\_Protection = IN \times CEO\_Protection$	0.012			0.005		

The sample includes 2,027 firm-years from S&P 500 firms over the 1995–2008 period. The sample is split into three groups. The small earnings decrease (SD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is smaller than the previous year's R&D. The large earnings decrease (LD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is greater than the previous year's R&D. The earnings increase (IN) group includes firm-years in which there is an increase in the pre-tax, pre-R&D earnings from the previous year to the current year. The following probit regression is estimated:

$$\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = &\ \alpha_1 SD_{i,t} + \alpha_2 LD_{i,t} + \alpha_3 IN_{i,t} + \beta_1 SD_{i,t} \times CEO\_Protection_{i,t} \\
&+ \beta_2 LD_{i,t} \times CEO\_Protection_{i,t} + \beta_3 IN_{i,t} \times CEO\_Protection_{i,t} + \gamma_1 \Delta RD_{i,t-1} \\
&+ \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} \\
&+ \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} \\
&+ \gamma_{13} CEO\_Equity_{i,t} + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \sum Control\ Variables_{i,t} \times LD_{i,t} \\
&+ \sum Control\ Variables_{i,t} \times IN_{i,t} + \varepsilon_{i,t},
\end{aligned} \tag{2}$$

TABLE 5 (continued)

where *RD_Decrease* is an indicator for cutting R&D; it equals 1 if the firm cuts R&D compared with the previous year, and 0 otherwise. *SD (LD, IN)* equals 1 for firm-years in the SD (*LD, IN*) group, and 0 otherwise. *CEO_Protection* is an indicator for CEO contractual protection; it equals 1 if the CEO has an employment agreement or a standalone severance pay agreement, and 0 otherwise. In Column (1), we replace *CEO_Protection* with its predicted value from the first-stage regression. In Column (2), we add to the regression the inverse Mills ratio estimated from the first-stage regression. See Table 2 for details of the first-stage regression. The p-values are based on standard errors adjusted for firm and year clustering. The p-values are one-sided for *SD (LD, IN) × CEO_Protection,* and two-sided otherwise. The marginal effect is calculated as the change in the probability of cutting R&D when there is a change of one standard deviation in the continuous explanatory variables (or a change from 0 to 1 in the indicator variables), with other explanatory variables taking the value of the sample means. The calculation of the marginal effect for the interaction terms follows Norton, Wang, and Ai (2004).

See Appendix A for the measurement of the control variables.

(i) We find quantitatively similar results when we use the average R&D expenditures in the previous three years to determine whether there is an R&D cut in the current year. This indicates that our inferences are not driven by unusually high R&D expenditures in the previous years for firms without CEO protection.

(ii) Mergers and acquisitions (M&As) can lead to noise in classifying the firm-years into the different groups. Hence, we exclude the firm-years with M&As or the firm-years with major M&As (i.e., M&As with a deal value greater than 10 percent of the firm's beginning-of-year total assets). The results are quantitatively similar.[26]

(iii) It is unclear whether the previous year's R&D expenditures and earnings are the right benchmarks when a new CEO joins the firm. We find quantitatively similar results after excluding the firm-years in which the CEO first joins the firm.

(iv) In the main analyses, we follow Bushee (1998) and assume that the earnings target is the previous year's earnings. Alternatively, we assume that managers wish to avoid losses and use zero as the earnings target by focusing on those firm-years in which the pre-tax, pre-R&D earnings exceed zero by an amount smaller than the previous year's R&D; these firms can avoid losses by cutting R&D. The inferences remain the same. Note that as in Bushee (1998), we do not use analyst forecasts as the earnings target because using analyst forecasts requires an estimate of analysts' expectations of the current year's R&D expenditures and tax expenses to calculate the pre-tax, pre-R&D earnings target. Further complications arise if analysts anticipate a cut in R&D.

(v) Our inferences remain the same after controlling for additional variables. First, one might argue that the different results for the three groups are driven by different levels of R&D across these groups. We find that the three groups do not differ significantly in their levels of R&D. Controlling for the level of R&D in the regressions does not affect our inferences either; the coefficient on the level of R&D is insignificant. Second, we obtain similar results for CEO protection after controlling for corporate governance (board independence and G-score), accrual earnings management (proxied by abnormal accruals), a founder CEO indicator, and industry fixed effects. To ensure that the model specifications are tractable and comparable with previous research, we do not include these variables in the main analyses.

---

[26] We acknowledge that we cannot fully address the noise in identifying the SD group related to some accounting problems. While such noise should bias against finding results consistent with our prediction, we would like to remind readers to keep this caveat in mind when interpreting the results.

(vi) While some firms consistently use or do not use CEO protection throughout the sample period, other firms switch back and forth (i.e., they have it in some years, but not in others). To ensure that our results are not driven by the firms that consistently use or do not use CEO protection, and to further alleviate the endogeneity concern (by using the same firm as a control), we examine whether our results hold for the group of firms that switch. The untabulated analysis indicates that the results are similar.

(vii) In the main analyses, we combine employment agreements and severance pay agreements because both types of agreement protect CEOs from short-term performance swings and downside risk. In an untabulated analysis, we investigate whether the results apply to both types. We construct two separate indicator variables for employment agreements and standalone severance pay agreements, respectively. We find that in the SD group, both indicators have significantly negative coefficients, indicating that both employment agreements and standalone severance pay agreements can reduce CEOs' incentives to engage in myopic behavior.

CEO Contractual Protection and Managerial Short-Termism—The Duration and Strength of Protection

In this section, we report the tests of H2—whether the effect of CEO contractual protection increases with the duration and strength of protection. As discussed above, the effect of CEO contractual protection is primarily driven by the SD group. Therefore, we focus on the SD group to increase the power of the tests and to simplify the presentation of the results. Further, we only tabulate the results using the Heckman (1979) approach to save space. Note that (1) using the predicted value of the probability of CEO protection in the regressions leads to qualitatively similar results, and (2) the results for the variables of interest are insignificant for the LD and IN groups. The above also applies to the other cross-sectional analyses presented in the next section.

To investigate the influence of the duration of CEO protection, we construct three indicator variables: *Duration0, Duration1,* and *Duration2*. Standalone severance pay agreements typically do not have an expiration date and, hence, can offer CEOs protection over the foreseeable future. While employment agreements are for a fixed period, some can be renewed automatically. *Duration2* equals 1 for CEOs with standalone severance pay agreements and those with employment agreements with an automatic renewal clause, and 0 otherwise. Among CEOs with employment agreements without an automatic renewal clause, those in the earlier stage of employment agreements should be less concerned with contract renewal than those in the later stage. Accordingly, we use *Duration1* and *Duration0* to indicate these two groups; *Duration1* (*Duration0*) equals 1 for firm-years in the earlier (later) stage of CEO employment agreements without an automatic renewal clause, and 0 otherwise.[27] Note that these three indicator variables are mutually exclusive and collectively cover all firm-years with CEO contractual protection. As such, we do not include the indicator for CEO contractual protection in the regression. As a result, the regression specification used to test the effect of the duration of CEO contractual protection is as follows:

---

[27] We use the sample median of the remaining contract years to distinguish between the earlier and later stages of employment agreements. Among the firm-years with CEO contractual protection, *Duration2* is 1 for 60 percent of the firm-years, *Duration1* is 1 for 20 percent of the firm-years, and *Duration0* is 1 for 20 percent of the firm-years. Note that *Duration2, Duration1,* and *Duration0* are all 0 for firm-years without CEO contractual protection.

$$
\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = &\ \alpha + \beta_1 Duration0_{i,t} + \beta_2 Duration1_{i,t} + \beta_3 Duration2_{i,t} \\
&+ \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} \\
&+ \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t} \\
&+ \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} \\
&+ \gamma_{13} CEO\_Equity_{i,t} + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}. \quad (3a)
\end{aligned}
$$

Column (1) of Table 6 reports the regression results. The results are consistent with our prediction. The coefficients on the three duration indicator variables are all negative. However, the coefficient on *Duration0* is only marginally significantly different from zero (p-value = 0.149), indicating that CEOs in the later stage of their employment agreements are only marginally less myopic than those without any contractual protection. In contrast, the coefficients on *Duration1* and *Duration2* are significantly different from zero at the 0.003 and 0.001 levels, respectively. F-tests (untabulated) indicate that the coefficients on *Duration1* and *Duration2,* while insignificantly different from each other, are significantly different from the coefficient on *Duration0* (p-value = 0.045 and 0.031, respectively). These results indicate that the moderating effect of CEO contractual protection on the extent of myopic behavior increases with the duration of the protection.

To test the effect of the strength of CEO protection, we rely on the amount of predetermined severance pay in either the employment agreement or the standalone severance pay agreement. Such agreements usually specify the severance pay as a multiple of the basic salary and also allow unexercisable options (unvested stocks) to become immediately exercisable (vested). Because the latter portion is difficult to quantify *ex ante,* we follow Rau and Xu (2013) and code the severance pay multiple, i.e., the ratio of the severance pay to the basic salary. We construct an ordinal variable, *Strength,* to capture the monetary strength of the protection. If the multiple is above three, then we code *Strength* as 2; if the multiple is between two and three, then we code *Strength* as 1; and if the multiple is below two, then we code *Strength* as 0. Firm-years with CEO contractual protection, but without information on severance pay, are excluded from this analysis.[28] Specifically, we use the following regression to test the effect of the strength of CEO contractual protection:

$$
\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = &\ \alpha + \beta_1 CEO\_Protection_{i,t} + \beta_2 Strength_{i,t} + \gamma_1 \Delta RD_{i,t-1} \\
&+ \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} \\
&+ \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} \\
&+ \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} + \gamma_{13} CEO\_Equity_{i,t} \\
&+ \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}. \quad (3b)
\end{aligned}
$$

Column (2) of Table 6 reports the regression results. The regression includes both the CEO contractual protection indicator and the strength variable. As such, the coefficient on *CEO_ Protection* captures the difference between firm-years with a low severance pay multiple and those without CEO contractual protection, and the coefficient on *Strength* captures the incremental effect of the monetary strength of the protection. Consistent with our prediction, the coefficients on both *CEO_Protection* and *Strength* are significantly negative, indicating that CEO contractual protection can reduce the extent of myopic behavior, and the effect further increases with the monetary strength of the protection.

In sum, we find that the effect of CEO contractual protection in reducing myopic behavior increases with the duration and monetary strength of the protection. These findings reinforce the inference from the main analyses.

---

[28] Among the firm-years with CEO contractual protection and information on severance pay, 32 percent have a severance pay multiple above three, 38 percent have a severance pay multiple between two and three, and 30 percent have a severance pay multiple below two. *Strength* is 0 for firm-years without CEO contractual protection.

TABLE 6

CEO Contractual Protection and Managerial Short-Termism
The Incremental Effect of the Duration and Strength of CEO Protection for the Small Earnings Decrease (SD) Group

	(1) Duration of CEO Protection			(2) Strength of CEO Protection		
	Coeff.	p-value	Marginal Effect	Coeff.	p-value	Marginal Effect
Intercept	1.453	0.085		1.524	0.086	
Protection_Level: Duration0	−0.271	0.149	−0.108			
Protection_Level: Duration1	−0.696	0.003	−0.269			
Protection_Level: Duration2	−0.697	0.001	−0.272			
CEO_Protection				−0.457	0.013	−0.179
Protection_Level: Strength				−0.199	0.056	−0.062
Previous year's change in R&D	0.820	0.001	0.101	0.960	0.001	0.118
Change in industry R&D intensity	−0.796	0.131	−0.046	−0.687	0.173	−0.040
Change in GDP	−3.430	0.391	−0.026	−5.145	0.236	−0.038
Tobin's Q	0.062	0.192	0.051	0.033	0.512	0.027
Change in capital expenditures	−0.463	0.018	−0.076	−0.384	0.069	−0.063
Change in sales	−0.822	0.001	−0.169	−0.807	0.001	−0.171
Firm size	−0.117	0.076	−0.058	−0.109	0.118	−0.055
Distance from earnings goal	−0.073	0.775	−0.009	0.080	0.778	0.009
Leverage	−0.263	0.605	−0.016	−0.430	0.425	−0.027
Free cash flows	0.308	0.439	0.025	0.306	0.462	0.025
Institutional ownership	−0.263	0.619	−0.018	−0.164	0.765	−0.011
CEO age dummy	0.449	0.055	0.172	0.508	0.034	0.191
CEO equity incentives	−4.222	0.042	−0.059	−3.281	0.091	−0.049
CEO abnormal compensation	−0.345	0.108	−0.053	−0.397	0.073	−0.061
Inverse Mills Ratio	0.223	0.175	0.044	0.211	0.249	0.041
n	385			338		
Pseudo R^2	0.169			0.175		

The sample includes 2,027 firm-years from S&P 500 firms over the 1995–2008 period. The sample is split into three groups. The small earnings decrease (SD) group is the test group. It includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is smaller than the previous year's R&D. The comparison groups include the large earnings decrease (LD) group and the earnings increase (IN) group. The results for the comparison groups are omitted to save space. The following probit regressions are estimated:

$$Prob(RD\_Decrease_{i,t} = 1) = \alpha + \beta_1 Duration0_{i,t} + \beta_2 Duration1_{i,t} + \beta_3 Duration2_{i,t} + \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t}$$
$$+ \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t}$$
$$+ \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t}$$
$$+ \gamma_{13} CEO\_Equity_{i,t} + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}, \tag{3a}$$

$$Prob(RD\_Decrease_{i,t} = 1) = \alpha + \beta_1 CEO\_Protection_{i,t} + \beta_2 Strength_{i,t} + \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t}$$
$$+ \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t}$$
$$+ \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} + \gamma_{13} CEO\_Equity_{i,t}$$
$$+ \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}, \tag{3b}$$

where *RD_Decrease* is an indicator for cutting R&D; it equals 1 if the firm cuts R&D compared to the previous year, and 0 otherwise. In Regression (3a), there are three indicator variables related to the duration of CEO protection. *Duration2* equals 1 for CEOs with standalone severance pay agreements or CEOs with automatically renewable employment agreements, and 0 otherwise. *Duration1* equals 1 for CEOs in the earlier stage of employment agreements without an automatic renewal clause, and 0 otherwise. *Duration0* equals 1 for CEOs in the later stage of employment agreements

TABLE 6 (continued)

without an automatic renewal clause, and 0 otherwise. *Duration2, Duration1,* and *Duration0* equal 0 for CEOs without contractual protection. In Regression (3b), *CEO_Protection* is an indicator for CEO contractual protection; it equals 1 if the CEO has an employment agreement or a standalone severance pay agreement, and 0 otherwise. *Strength* is an ordinal variable for the strength of the protection; it equals 2 if the severance pay multiple—how many times the severance pay is relative to the basic salary—is above three, 1 if the multiple is between two and three, and 0 if the multiple is below two. *CEO_Protection* and *Strength* equal 0 for CEOs without contractual protection. Firm-years with CEO contractual protection, but without information on severance pay, are excluded from Regression (3b). We add to the regressions the inverse Mills ratio estimated from the first-stage regression. See Table 2 for details of the first-stage regression. The p-values are based on standard errors adjusted for firm and year clustering. The p-values are one-sided for *CEO_Protection* and the duration and strength variables, and two-sided otherwise. The marginal effect is calculated as the change in the probability of cutting R&D when there is a change of one standard deviation in the continuous explanatory variables (or a change from 0 to 1 in the indicator variables), with the other explanatory variables taking the value of the sample means.

See Appendix A for the measurement of control variables.

CEO Protection and Managerial Short-Termism—Cross-Sectional Analyses

In this section, we report the cross-sectional analyses that test H3, H4, and H5. We add to the regressions the main effect of the conditional variable and its interaction with the CEO protection indicator. The regression model is as follows:

$$
\begin{aligned}
Prob(RD\_Decrease_{i,t} = 1) = {} & \alpha + \beta_1 CEO\_Protection_{i,t} + \beta_2 Conditional\_Var_{i,t} \\
& + \beta_3 CEO\_Protection_{i,t} \times Conditional\_Var_{i,t} + \gamma_1 \Delta RD_{i,t-1} \\
& + \gamma_2 \Delta Ind\_RD_{i,t} + \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} \\
& + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t} + \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} \\
& + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t} + \gamma_{13} CEO\_Equity_{i,t} \\
& + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}.
\end{aligned} \tag{4}
$$

The conditional variable, *Conditional_Var,* is one of the following three indicator variables: *Industry_Homogeneity, Transient_Inst,* or *Low_Board_Independence,* corresponding to H3–H5.[29] *Industry_Homogeneity* equals 1 if the firm operates in an industry that is more homogeneous than the sample median, and 0 otherwise. Following Parrino (1997), for each firm in the industry (based on two-digit SICs), we first calculate the percentage of the variation in monthly stock returns that is explained by an equal-weighted industry index over the previous ten years. We then measure industry homogeneity as the median across all firms in the industry. The assumption is that the more the stock prices of firms in the same industry move together, the more homogeneous the industry is. *Transient_Inst* equals 1 if the ownership of transient institutional investors in the firm is higher than the sample median, and 0 otherwise.[30] *Low_Board_Independence* equals 1 if the percentage of independent directors is lower than the sample median, and 0 otherwise. H3, H4, and H5 predict that the effect of CEO protection on the likelihood of cutting R&D in the SD group is more negative for firms in more homogenous industries, for firms with higher transient institutional ownership, and for firms with lower board independence. That is, the coefficient on the interaction term β_3 is expected to be negative for the SD group.

Table 7 reports the regression results. As reported, the main effect of industry homogeneity is significantly positive (p-value = 0.006), suggesting that without CEO protection, industry

---

[29] We use indicator variables to facilitate the interpretation of the results and to allow for non-linearity. In an untabulated sensitivity analysis, we also use the standardized decile ranks for the conditional variables, and the inferences remain the same.

[30] We thank Brian Bushee for providing data on the classification of institutional investors.

TABLE 7

CEO Contractual Protection and Managerial Short-Termism
Cross-Sectional Analyses for the Small Earnings Decrease (SD) Group

	Coeff.	p-value	Marginal Effect
Intercept	0.559	0.538	
CEO_Protection	0.335	0.837	0.133
CEO_Protection × *Industry_Homogeneity*	−0.857	0.002	−0.331
CEO_Protection × *Transient_Inst*	−0.501	0.037	−0.198
CEO_Protection × *Low_Board_Independence*	−0.732	0.013	−0.285
Industry_Homogeneity	0.644	0.006	0.250
Transient_Inst	0.385	0.071	0.152
Low_Board_Independence	0.645	0.010	0.251
Previous year's change in R&D	0.887	0.001	0.109
Change in industry R&D intensity	−0.750	0.157	−0.043
Change in GDP	−3.165	0.444	−0.024
Tobin's Q	0.060	0.240	0.049
Change in capital expenditures	−0.442	0.021	−0.073
Change in sales	−0.762	0.001	−0.157
Firm size	−0.111	0.096	−0.055
Distance from earnings goal	−0.030	0.910	−0.004
Leverage	−0.255	0.634	−0.015
Free cash flows	0.148	0.714	0.012
Institutional ownership	−0.120	0.824	−0.008
CEO age dummy	0.386	0.097	0.148
CEO equity incentives	−4.666	0.025	−0.065
CEO abnormal compensation	−0.478	0.030	−0.074
Inverse Mills Ratio	0.311	0.073	0.061
n	385		
Pseudo R^2	0.196		

The sample includes 2,027 firm-years from S&P 500 firms over the 1995–2008 period. The sample is split into three groups. The small earnings decrease (SD) group is the test group. It includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings from the previous year to the current year, and the decrease is smaller than the previous year's R&D. The comparison groups include the large earnings decrease (LD) group and the earnings increase (IN) group. The results for the comparison groups are omitted to save space. The following probit regression is estimated:

$$Prob(RD\_Decrease_{i,t} = 1) = \alpha + \beta_1 CEO\_Protection_{i,t} + \beta_2 Conditional\_Var_{i,t}$$
$$+ \beta_3 CEO\_Protection_{i,t} \times Conditional\_Var_{i,t} + \gamma_1 \Delta RD_{i,t-1} + \gamma_2 \Delta Ind\_RD_{i,t}$$
$$+ \gamma_3 \Delta GDP_{i,t} + \gamma_4 Tobin\_Q_{i,t} + \gamma_5 \Delta CAPX_{i,t} + \gamma_6 \Delta Sales_{i,t} + \gamma_7 Size_{i,t}$$
$$+ \gamma_8 Distance\_Goal_{i,t} + \gamma_9 Leverage_{i,t} + \gamma_{10} FCF_{i,t} + \gamma_{11} INST_{i,t} + \gamma_{12} CEO\_Age_{i,t}$$
$$+ \gamma_{13} CEO\_Equity_{i,t} + \gamma_{14} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}, \tag{4}$$

where *RD_Decrease* is an indicator for cutting R&D; it equals 1 if the firm cuts R&D compared to the previous year, and 0 otherwise. *CEO_Protection* is an indicator for CEO contractual protection; it equals 1 if the CEO has an employment agreement or a standalone severance pay agreement, and 0 otherwise. *Conditional_Var* is one of the following three indicator variables: *Industry_Homogeneity, Transient_Inst,* and *Low_Board_Independence. Industry_Homogeneity* equals 1 if the firm operates in an industry that is more homogeneous than the sample median, and 0 otherwise. For each firm in the industry (based on two-digit SICs), we first calculate the percentage of the variation in monthly stock returns that is explained by an equal-weighted industry index over the previous ten years. We then measure industry homogeneity as the median across all firms in the industry. *Transient_Inst* equals 1 if the ownership of transient institutional investors in the firm is higher than the sample median, and 0 otherwise. *Low_Board_Independence* equals 1 if less than 75 percent of the directors (sample median) are independent, and 0 otherwise. We add to the regressions the inverse Mills ratio estimated from the first-stage regression. See Table 2 for details of the first-stage regression. The p-values are based on standard errors adjusted for firm and year clustering. The p-values are one-sided for *CEO_Protection,* the conditional variables, and the interaction terms, and two-sided

(continued on next page)

TABLE 7 (continued)

otherwise. The marginal effect is calculated as the change in the probability of cutting R&D when there is a change of one standard deviation in the continuous explanatory variables (or a change from 0 to 1 in the indicator variables), with other explanatory variables taking the value of the sample means. The calculation of the marginal effect for the interaction terms follows Norton et al. (2004).
See Appendix A for the measurement of the control variables.

homogeneity can induce myopic behavior, probably due to the higher threat of CEO dismissal in more homogeneous industries (e.g., DeFond and Park 1997). More importantly, consistent with H3, the effect of CEO protection on managerial myopia is greater in more homogeneous industries; the coefficient on the interaction of CEO protection and industry homogeneity is significantly negative (p-value = 0.002, and the marginal effect is −33.1 percentage points).[31]

An intriguing question is why some CEOs in more homogeneous industries do not have contractual protection. One possibility is that those CEOs receive higher compensation. If this is the case, then we should observe that among the CEOs without contractual protection, those in more homogenous industries will have higher compensation. We do not find such evidence. We conjecture that this is probably due to the low negotiation power of CEOs in more homogeneous industries. The two effects (demanding high compensation due to higher risk of being replaced, and commanding lower compensation due to lower negotiation power) are opposite and can offset each other. The low negotiation power of CEOs in more homogeneous industries can actually exacerbate the myopic behavior of CEOs without contractual protection in such industries, lending further support for our arguments underlying H3.

With respect to transient institutional ownership, the main effect is significantly positive in Table 7 (p-value = 0.071), consistent with transient institutional investors' short horizon, which incentivizes managers to deliver short-run performance (Bushee 1998). More importantly, consistent with H4, the effect of CEO protection on managerial myopia is greater in firms with higher transient institutional ownership; the coefficient on the interaction of CEO protection and transient institutional ownership is significantly negative (p-value = 0.037, and the marginal effect is −19.8 percentage points).

Last, with respect to board independence, the main effect of low board independence in Table 7 is significantly positive (p-value = 0.010), consistent with the role of board monitoring in alleviating managerial myopia. Consistent with H5, the interactive effect is significantly negative (p-value = 0.013, and the marginal effect is −28.5 percentage points). This finding suggests that the incremental effect of CEO protection is stronger when board independence is lower. CEO protection and board monitoring appear to be alternative mechanisms for alleviating managerial myopia. In an untabulated analysis, we also find that the effect of CEO protection is stronger when CEO incentive compensation is lower, consistent with the view that CEO protection and incentive compensation are alternative ways of addressing managerial short-termism (Rau and Xu 2013).

In sum, consistent with our hypotheses, the effect of CEO protection on managerial myopia is greater for firms in more homogeneous industries, for firms with higher transient institutional ownership, and for firms with lower board independence. These results suggest that the effect of

[31] In an untabulated additional analysis, we examine another industry characteristic, the degree of competition. Giroud and Mueller (2010) find that competition in the product market can reduce managerial slack and myopia. It follows that the effect of CEO protection on managerial myopia should become smaller in more competitive industries. We find results consistent with this prediction. In addition, including industry competition and its interaction with CEO contractual protection in the regressions does not affect the results reported in Table 7, including those on industry homogeneity.

CEO protection on managerial myopia is stronger when CEOs have stronger incentives to engage in myopic behavior and when the alternative mechanisms for curbing myopic behavior are less effective.

VI. ADDITIONAL TESTS

Alternative Proxies for Managerial Short-Termism

The Likelihood of Cutting R&D and Advertising Expenditures

As with R&D expenditures, advertising expenditures are also subject to managerial discretion and are expensed in the period in which they occur. Thus, we use the likelihood of cutting total R&D and advertising expenditures as the proxy for managerial short-termism and examine whether our inferences still hold. The methodology is very similar to that described in Section V, except that we use the sum of R&D and advertising expenditures in place of R&D expenditures for the sample selection and research design. For example, the small earnings decrease (SD) group refers to firm-years in which there is a decrease in the pre-tax, pre-R&D and advertising earnings, and the decrease is smaller than the previous year's R&D and advertising expenditures. The analyses (untabulated) indicate that the results are consistent with those in Section V.

Real Earnings Management Proxies

We also investigate how CEO contractual protection affects the extent of real earnings management, an alternative proxy for managerial short-termism. Following Roychowdhury (2006), we measure the extent of real earnings management using abnormal production costs and abnormal discretionary expenditures. Following Zang (2012), we combine these two measures to capture the overall extent of real earnings management (abnormal production costs minus abnormal discretionary expenditures, both scaled by lagged assets).[32] As in Roychowdhury (2006), we focus on the suspect firm-years—those that meet or just beat earnings benchmarks—to increase the power of the tests. Compared to the non-suspect firm-years, the suspect firm-years are more likely to have engaged in real earnings management to meet short-term earnings targets. The earnings benchmarks here include zero, the previous year's earnings, and analysts' consensus forecasts.

We follow prior studies in choosing the control variables and run the following regression for the suspect firm-years:

$$
\begin{aligned}
RealEM_{i,t} = {} & \alpha + \beta_1 CEO\_Protection_{i,t} + \gamma_1 Tobin\_Q_{i,t} + \gamma_2 \Delta Sales_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Leverage_{i,t} \\
& + \gamma_5 FCF_{i,t} + \gamma_6 ROA_{i,t} + \gamma_7 INST_{i,t} + \gamma_8 CEO\_Age_{i,t} + \gamma_9 CEO\_Equity_{i,t} \\
& + \gamma_{10} CEO\_Abnormal\_Comp_{i,t} + \varepsilon_{i,t}.
\end{aligned} \tag{5}
$$

Real EM measures the extent of real earnings management. For brevity, we do not tabulate the results. Consistent with H1, the coefficient on the CEO protection indicator is significantly negative, indicating that firms with CEO contractual protection are less likely to engage in real earnings management. We also expand Regression (5) to test H2–H5, as in Tables 6 and 7. The results are as predicted. The effect of CEO contractual protection on real earnings management is stronger when CEO contractual protection is of longer duration and greater monetary strength, for firms in more homogeneous industries, for firms with higher transient institutional ownership, and for firms with lower board independence.[33]

---

[32] We do not use the abnormal level of operating cash flows in the analysis because both Roychowdhury (2006) and Zang (2012) argue that real earnings management activities have an ambiguous effect on operating cash flows.

[33] As expected, we do not find significant results on the variables of interest for the non-suspect firm-years.

Alternative Explanation: Differential Investment Opportunities

One might argue that our results can be explained by differential investment opportunities: firms without CEO contractual protection have fewer investment opportunities than those with CEO contractual protection and, hence, the former are more likely to cut R&D than the latter. If this is the case, then we should find similar results for the three groups. However, we do not find that firms without CEO protection are more likely to cut R&D than those with CEO protection for the LD and IN groups, inconsistent with this alternative explanation.

We conduct an additional analysis to test this alternative explanation. Under the alternative explanation, firms without CEO protection have fewer investment opportunities and, thus, should also be more likely to cut other long-term investments, such as capital expenditures (CAPX). However, unlike cutting R&D, cutting CAPX does not improve reported earnings in the same period. Thus, under the myopia argument, we do not expect the likelihood of cutting CAPX to differ between firms with and without CEO protection. For this test, we replace the indicator for cutting R&D in Regressions (1) and (2) with an indicator for cutting CAPX and replicate the analyses. (The model specification remains the same except that we replace the change in CAPX on the right-hand side with the lagged change in CAPX.) The untabulated analysis indicates that the effect of CEO protection on cutting CAPX is insignificant for the full sample and for the three groups. This result confirms that our results on cutting R&D are unlikely to be driven by differential investment opportunities between firms with and those without CEO protection.

CEO Contractual Protection and Firm Performance in the Future

Our findings indicate that CEO contractual protection can address managerial short-termism, especially for the SD group. One question, then, is whether CEO protection helps to improve firm performance in the future. For firm-years in which managers have strong incentives to engage in myopic behavior, CEO contractual protection can alleviate managerial myopia and potentially lead to better performance in the future. In this section, we examine whether firms with CEO contractual protection experience better performance in the future than those without.

Table 8 reports the regression results, first for the full sample (Panel A) and then for the three groups (Panel B). The dependent variable is the average industry-adjusted ROA (return on assets) or CFO (cash flows from operations scaled by lagged assets) in the subsequent three years. The choice of control variables follows prior research. In Panel A, we find that the coefficient on *CEO_Protection* is insignificant (p-value = 0.786 and 0.990 for future ROA and CFO, respectively). This suggests that, on average, CEO contractual protection is not associated with better performance in the future. In Panel B, when we separately investigate the three groups, the coefficient on $SD \times CEO\_Protection$ is significantly positive (p-value = 0.034 and 0.022 for future ROA and CFO, respectively). This indicates that within the SD group, CEO contractual protection is associated with better performance in the future. In contrast, the coefficients on $LD \times CEO\_Protection$ and $IN \times CEO\_Protection$ are insignificant; F-tests indicate that the coefficient on $SD \times CEO\_Protection$ is significantly different from the coefficient on $LD \times CEO\_Protection$ or $IN \times CEO\_Protection$.

In sum, we find that while, on average, CEO contractual protection is not correlated with better performance in the future, within the SD group, where the incentive to engage in myopic behavior is particularly strong, firms with CEO protection experience better performance in the future than those without. This result speaks to the economic benefits of alleviating managerial short-termism.

VII. CONCLUSION

In this paper, we examine whether CEO contractual protection, in the form of employment agreements and standalone severance pay agreements, helps to reduce managerial short-termism.

TABLE 8 (continued)

and *CFO* is cash flows from operations scaled by lagged assets. *CEO_Protection* is an indicator for CEO contractual protection; it equals 1 if the CEO has an employment agreement or a standalone severance pay agreement, and 0 otherwise. *SD* (*LD, IN*) is an indicator for firm-years in the small earnings decrease (large earnings decrease, earnings increase) group. The inverse Mills ratio is estimated from the first-stage regression; see Table 2 for details of the first-stage regression. The p-values are two-sided and are based on standard errors adjusted for firm and year clustering. The other variables are defined in Appendix A.

Managers have incentives to boost short-term performance to increase their welfare, potentially at the expense of long-term firm value. However, CEOs with contractual protection are protected from short-term performance swings and downside risk and, consequently, have weaker incentives to engage in myopic behavior.

To test this prediction, we hand-collect information on CEO employment and severance pay agreements from firms' proxy statements. The main proxy we use for managerial myopia is cutting R&D. The sample includes 2,027 firm-years from S&P 500 firms over the 1995–2008 period that have proxy statements and significant R&D expenditures. We also split the sample into three groups. The small earnings decrease (SD) group includes firm-years in which there is a decrease in the pre-tax, pre-R&D earnings compared to the previous year, but the decrease is smaller than the previous year's R&D. The other two groups are the large earnings decrease (LD) and the earnings increase (IN) groups. The incentive to cut R&D to avoid earnings declines is most salient in the SD group and, hence, we predict that the effect of CEO contractual protection is greater in the SD group than in the other groups.

The results are consistent with our predictions. We find that CEO contractual protection is associated with a lower likelihood of cutting R&D, and that this effect is primarily driven by the SD group, in which the incentives to engage in myopic behavior are particularly strong. The effect of CEO contractual protection is both statistically and economically significant. We also find that the effect of CEO contractual protection increases with the duration and monetary strength of the protection. For the cross-sectional tests, we predict and find that the effect of CEO protection is greater for firms in more homogenous industries, firms with higher transient institutional ownership, and firms with lower board independence. These results indicate that the effect of CEO protection on managerial myopia is stronger when CEOs have stronger incentives to engage in myopic behavior or when alternative mechanisms to curb myopic behavior are weaker.

We conduct additional analyses to provide further insights and to address alternative explanations. First, we use the extent of real earnings management to proxy for managerial myopia, and the inferences are the same. Second, we conduct tests to rule out the alternative explanation that investment opportunities differ between firms with and without CEO protection. Third, we find that within the SD group, CEO protection is associated with better performance in the future. This speaks to the economic benefits of alleviating managerial short-termism.

Our paper contributes to the literature by examining how CEO contractual protection affects managerial short-termism. The findings suggest that CEO contractual protection reduces managers' incentives to engage in myopic behavior. Therefore, our study complements prior studies that investigate how board monitoring and CEO equity incentives address managerial short-termism, and advances the emerging literature on the effects of CEO contracts on corporate decisions. A limitation of our study is that we only focus on CEO employment agreements and severance pay agreements. Other types of contracts between CEOs and firms, such as change-in-control agreements, profit-sharing, or royalty agreements, may also provide CEOs with protection. We leave it to future research to investigate the effect of these other types of contracts.

REFERENCES

Almazan, A., and J. Suarez. 2003. Entrenchment and severance pay in optimal governance structures. *Journal of Finance* 58 (2): 519–547.

Armstrong, C. S., A. D. Jagolinzer, and D. F. Larcker. 2010. Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research* 48 (2): 225–271.

Aspen Institute. 2009. *Overcoming Short-Termism: A Call for a More Responsible Approach to Investment and Business Management*. Available at: http://www.aspeninstitute.org/sites/default/files/content/images/BSPonlineBroch.pdf

Autor, D. H., J. J. Donohue III, and S. J. Schwab. 2004. Employment consequences of wrongful-discharge laws: Large, small, or none at all? *American Economic Review Papers and Proceedings* 93 (2): 440–446.

Baber, W. R., P. M. Fairfield, and J. A. Haggard. 1991. The effect of concern about reported income on discretionary spending decisions: The case of research and development. *The Accounting Review* 66 (4): 818–829.

Bebchuk, L., and J. Fried. 2004. *Pay Without Performance: The Unfulfilled Promise of Executive Compensation*. Boston, MA: Harvard University Press.

Bertrand, M., and S. Mullainathan. 1999. Is there discretion in wage setting? A test using takeover legislation. *The RAND Journal of Economics* 30 (3): 535–554.

Bertrand, M., and S. Mullainathan. 2003. Enjoying the quiet life? Corporate governance and management preference. *Journal of Political Economy* 111 (5): 1043–1075.

Burns, N., and S. Kedia. 2006. The impact of performance-based compensation on misreporting. *Journal of Financial Economics* 79: 35–67.

Bushee, B. 1998. The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73 (3): 305–333.

Cadman, B. D., J. L. Campbell, and S. Klasa. 2014. *Are Ex-Ante CEO Severance Pay Contracts Consistent with Efficient Contracting?* Working paper, The University of Utah.

Chen, S., X. Chen, and Q. Cheng. 2008. Do family firms provide more or less voluntary disclosure? *Journal of Accounting Research* 46 (3): 499–536.

Cheng, Q., and T. Warfield. 2005. Equity incentives and earnings management. *The Accounting Review* 80: 441–476.

Cheng, S. 2004. R&D expenditures and CEO compensation. *The Accounting Review* 79 (2): 305–328.

Comprix, J., and K. A. Muller III. 2006. Asymmetric treatment of reported pension expense and income amounts in CEO cash compensation calculations. *Journal of Accounting and Economics* 42 (3): 385–416.

Dechow, P. M., and R. G. Sloan. 1991. Executive incentives and the horizon problem. *Journal of Accounting and Economics* 14: 51–89.

DeFond, M., and C. Park. 1997. Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics* 23: 115–139.

Dikolli, S. S., W. J. Mayew, and D. Nanda. 2014. CEO tenure and performance-turnover relation. *Review of Accounting Studies* 19 (1): 281–327.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2004. Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics* 71: 205–238.

Duchin, R., J. Matsusaka, and O. Ozbas. 2010. When are outside directors effective? *Journal of Financial Economics* 96: 195–214.

Efendi, J., A. Srivastava, and E. Swanson. 2007. Why do corporate managers misstate financial statements? The role of option compensation and other factors. *Journal of Financial Economics* 85: 667–708.

Erickson, M., M. Hanlon, and E. Maydew. 2006. Is there a link between executive equity incentives and accounting fraud? *Journal of Accounting Research* 44: 113–143.

Fama, E. F., and K. R. French. 1997. Industry costs of equity. *Journal of Financial Economics* 43: 153–193.

Farber, D. 2005. Restoring trust after fraud: Does corporate governance matter? *The Accounting Review* 80: 539–561.

Fudenberg, D., and J. Tirole. 1995. A theory of income and dividend smoothing based on incumbency rates. *Journal of Political Economy* 103: 75–93.

Garmaise, M. 2011. Ties that truly bind: Non-competition agreements, executive compensation and firm investment. *Journal of Law, Economics, and Organization* 27 (2): 376–425.

General Electric Company (GE). 2006. *Notice of 2006 Annual Meeting and Proxy Statement*. Available at: http://www.ge.com/sites/default/files/ge_proxy2006.pdf

Gillan, S. L., J. C. Hartzell, and R. Parrino. 2009. Explicit versus implicit contracts: Evidence from CEO employment agreements. *Journal of Finance* 64 (4): 1629–1655.

Giroud, X., and H. Mueller. 2010. Does corporate governance matter in competitive industries? *Journal of Financial Economics* 95: 312–331.

Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40: 3–73.

Heckman, J. 1979. Sample selection bias as a specification error. *Econometrica* 47: 153–161.

Huang, P. 2011. *Marital Prenups? A Look at CEO Severance Agreements*. Working paper, Tulane University.

Inderst, R., and H. M. Mueller. 2005. *Keeping the Board in the Dark: CEO Compensation and Entrenchment*. Centre for Economic Policy Research (CEPR) Discussion Paper No. 5315. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1294170

Klein, A. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33: 375–400.

Knoeber, C. 1986. Golden parachutes, shark repellents, and hostile tender offers. *American Economic Review* 76: 155–167.

Larcker, D. F., and T. O. Rusticus. 2010. On the use of instrumental variables in accounting research. *Journal of Accounting and Economics* 49: 186–205.

Matsunaga, S., and C. Park. 2001. The effect of missing a quarterly earnings benchmark on the CEO's annual bonus. *The Accounting Review* 76 (3): 313–332.

Mergenthaler, R. D., S. Rajgopal, and S. Srinivasan. 2012. *CEO and CFO Career Penalties to Missing Quarterly Analyst Forecasts*. Working paper, The University of Iowa.

Muhl, C. J. 2001. The employment-at-will doctrine: Three major exceptions. *Monthly Labor Review* 124: 3–11.

Norton, E. C., H. Wang, and C. Ai. 2004. Computing interaction effects and standard errors in logit and probit models. *Stata Journal* 4: 154–167.

Parrino, R. 1997. CEO turnover and outside succession: A cross-sectional analysis. *Journal of Financial Economics* 46: 165–197.

Porter, M. 1992. *Capital Choices: Changing the Way America Invests in Industry*. Boston, MA: Harvard University Business School Council on Competitiveness.

Rau, P. R., and J. Xu. 2013. How do ex-ante severance pay contracts fit into optimal incentive schemes? *Journal of Accounting Research* 51 (3): 631–671.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42 (3): 335–370.

Rusticus, T. O. 2006. *Executive Severance Agreements*. Working paper, University of Pennsylvania.

Schwab, S. J., and R. S. Thomas. 2006. An empirical analysis of CEO employment contracts: What do top executives bargain for? *Washington and Lee Law Review* 63: 231–270.

Shleifer, A., and R. W. Vishny. 1990. Equilibrium short horizons of investors and firms. *American Economic Association Papers and Proceedings* 80 (2): 148–153.

Srinivasan, S. 2005. Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. *Journal of Accounting Research* 43: 291–334.

Stein, J. C. 1988. Takeover threats and managerial myopia. *Journal of Political Economy* 96 (1): 61–80.

Stein, J. C. 1989. Efficient capital markets, inefficient firms: A model of myopic corporation behavior. *Quarterly Journal of Economics* 104 (4): 655–669.

American Accounting Association

Wall Street Journal. 2011. Six Flags puts former CFO's case to rest. (July 25). Available at: http://blogs. wsj.com/cfo/2011/07/25/six-flags-puts-former-cfos-case-to-rest/

Xu, M. 2011. *CEO Contract Horizon and Investment.* Working paper, London School of Economics.

Xu, M. 2012. *The Costs and Benefits of Long-Term CEO Contracts.* Working paper, London School of Economics.

Yermack, D. 2006. Golden handshakes: Separation pay for retired and dismissed CEOs. *Journal of Accounting and Economics* 41: 237–256.

Zang, A. Y. 2012. Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review* 87 (2): 675–703.

APPENDIX A

Variable Measurements

Variable	Definition
$RD\_Decrease_{i,t}$	= indicator for cutting R&D, which equals 1 if R&D decreases compared to the previous year, and 0 otherwise;
$CEO\_Protection_{i,t}$	= indicator for CEO contractual protection, which equals 1 if the CEO has an employment agreement or a severance pay agreement, and 0 otherwise;
$\Delta RD_{i,t-1}$	= change in R&D in the previous year, calculated as the difference in the natural logarithm of R&D between the previous year and the year before;
$\Delta Ind\_RD_{i,t}$	= change in industry R&D intensity, calculated as the difference in the ratio of total industry R&D over total industry sales between the current year and the previous year, and the industry measures are based on all of the firms with the same four-digit SICs as firm i (excluding firm i);
$\Delta GDP_{i,t}$	= change in GDP, calculated as the difference in the natural logarithm of GDP between the current year and the previous year;
$Tobin\_Q_{i,t}$	= Tobin's Q, calculated as the sum of the market value of common equity, the book value of preferred stocks, and the book value of debt divided by total assets;
$\Delta CAPX_{i,t}$	= change in capital expenditures, calculated as the difference in the natural logarithm of capital expenditures between the current year and the previous year;
$\Delta Sales_{i,t}$	= change in sales, calculated as the difference in the natural logarithm of sales between the current year and the previous year;
$Size_{i,t}$	= natural logarithm of market value of equity (in millions);
$Distance\_Goal_{i,t}$	= distance from earnings goal, calculated as the difference in the pre-tax, pre-R&D earnings between the current year and the previous year, scaled by the previous year's R&D;
$Leverage_{i,t}$	= leverage, calculated as total debt divided by total assets;
$FCF_{i,t}$	= free cash flows, calculated as cash flows from operations minus capital expenditures, scaled by total assets;
$INST_{i,t}$	= institutional ownership, measured as the percentage of outstanding shares held by institutional investors;
$CEO\_Age_{i,t}$	= indicator for CEOs who are close to retirement, which equals 1 for CEOs who are 63 and older, and 0 otherwise;
$CEO\_Equity_{i,t}$	= CEOs' equity incentives, measured as a CEO's share and option holdings scaled by the total number of shares outstanding;
$CEO\_Abnormal\_Comp_{i,t}$	= CEOs' abnormal cash compensation, measured as the residual from the regression of the natural logarithm of CEO cash compensation on the natural logarithm of firm assets, ROA, the market-to-book ratio, CEO tenure, and industry and year indicators (Gillan et al. 2009); and
i,t	= firm i, year t subscripts.